

ACSC/DEA/217/95-05

REENGINEERING DEFENSE ACQUISITION  
A CONCEPT OF OPERATIONS FOR WAGING THE ACQUISITION  
CAMPAIGNS OF THE 21ST CENTURY

A Research Paper

Presented To

The Directorate of Research

Air Command and Staff College

In Partial Fulfillment of the Graduation Requirements of ACSC

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May 1995

### **Disclaimer**

The views expressed in this academic research paper are those of the authors and do not reflect official policy or position of the U.S. Government or Department of Defense.

## **Acknowledgments**

Our research team would like to express our sincere gratitude to the following individuals who generously gave of their limited time to read our report and provide insightful and detailed feedback.

Blaker, James, Dr., Special Assistant to the Vice Chairman, Office of the  
Vice Chairman of the Joint Chiefs of Staff  
Ferguson, Thomas R., Lieutenant General, USAF (Retired)  
Millar, Roy D., Colonel, USA, Deputy Program Executive Officer, Tactical  
Missiles  
Sheehan, Kevin, Lieutenant Colonel, USAF  
Russick, Christopher, Major, USAF

Though in some cases individual readers did not agree with our recommendations, their comments were very instrumental in helping us identify potential shortcomings in our proposal and ensuring the accuracy of the information provided in our report. Each of these individuals are acquisition experts in their own right. We can only hope that our coalescence of their comments and recommendations with our thinking, provides an adequate, if not optimal reflection of their combined expertise.

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## **Abstract**

The defense acquisition system has earned a reputation of being unable to provide the weapons the warfighters need at a value the Congress and American taxpayers deserve. At the macro level, acquisition is the convergence of five processes—requirements, technology, budgeting, management and operations and support. Micro-management of acquisition execution, when coupled with unstable requirements, technology and budgeting processes, results in a system that is not responsive to the customers’ needs. It is time to implement dramatic changes based on a process-oriented reengineering of the entire system and radically improve its performance.

To generate recommendations for system improvement, we assessed and restructured the top-level, macro processes associated with defense acquisition—relying on the time-proven tenet of centralized control with decentralized execution. To address current system shortfalls, we propose greatly expanding the role of the joint staff in preparing, planning and executing joint acquisition campaigns. We suggest the Department of Defense (DoD) execute acquisition campaigns by mirroring the way military forces plan and execute joint battle campaigns. We suggest process improvements which will strengthen the link between requirements definition and technology insertion. We also suggest altering the budgeting process to enable the DoD to submit a more unified budget position each fiscal year. We then developed a phased, methodical approach for implementing the proposed changes.

Our recommendations are controversial. We are challenging dogmatically accepted paradigms regarding the way the DoD bureaucracy functions and the roles of the joint staff. Before any of our proposed changes can be implemented, dramatic changes in current laws will have to occur. Our recommendations are not consistent with either the current interpretations of Title 10 or the law governing the size of the Joint Staff. However, only by changing the current bureaucratic organizations and culture will the acquisition community have a chance at providing the capabilities US warfighters need in the resource constrained environment in which the DoD will continue to find itself.

# REENGINEERING DEFENSE ACQUISITION

## *A Concept of Operations for Waging the Acquisition Campaigns of the 21st Century*

### Chapter 1—Introduction

Building a joint military capability to harness the Revolution in Military Affairs (RMA) will not be easy. History reveals a tendency for the services to diverge rather than coalesce during periods of relative fiscal austerity. That is, each of the services tends to put planning priority on assuring or protecting core competencies at the expense of those capabilities that support or facilitate operations of the other services. It is easier to be joint in word and deed in times of fiscal largess; parochialism is stronger when budgets draw down. The nation cannot afford and will not benefit from adhering to this traditional pattern.<sup>1</sup>

This quotation by Admiral William A. Owens, Vice Chairman, Joint Chiefs of Staff, highlights the pressing need to retain a joint focus to ensure the DoD acquisition community effectively meets the warfighters' needs. The joint focus is, however, but a means to an end. The current DoD acquisition system has proven incapable of producing weapon systems that meet the users' needs at the value the Congress and the taxpayers demand. In the aftermath of the cold war, as our defense budgets continue to shrink, the size of our acquisition force decreases and technology improves at an ever increasing rate, it will be even more imperative that the DoD acquisition system be modified and better integrated. This modification must ensure the overall acquisition system becomes more responsive to our customers' needs. By building a reengineered DoD acquisition system that maintains a joint perspective, the acquisition community will be better able to provide

the capabilities the warfighters need. Our end state is implementing an acquisition system that works.

We have all heard the wailing and gnashing of teeth throughout all levels of Congress, DoD, industry and the public that the acquisition system is “broken.” Charges abound that the acquisition system bureaucracy provides weapons to the user that are over cost, way behind schedule and do not meet the user’s requirements. While there is fairly broad consensus that we must do “something,” there is little consensus on just what that “something” is. In recent years, numerous streamlining initiatives led to alleged improvements in the way functional specialists execute their processes within the overall acquisition system. However, these limited system modifications have not generated the kind of fundamental changes necessary to make the system capable of adequately responding to warfighters’ needs. Piecemeal changes to the existing acquisition system are not the answer. It is time to fundamentally reevaluate the DoD acquisition system from a process-oriented perspective.

Our proposal involves injecting the time proven tenet of centralized control with decentralized execution to improve the overall acquisition system for all of DoD. A Joint Forces Commander (JFC) receives a mission and the necessary resources from higher authorities and then is singularly responsible for executing a successful military campaign. We all witnessed the successful application of this precept with the US coalition victory in Desert Storm. So too should an over-arching body provide requirements and acquisition “missions,” and charge a single individual with the responsibility for planning, programming and executing a successful acquisition campaign. Such unity of command would en-

able the DoD to more effectively acquire the weapon systems necessary to support our warfighters.

In an attempt to bound our research and at the same time have the greatest impact on the acquisition system, we chose to focus on the top-level, macro processes associated with DoD acquisition. It is at this level that our process changes will yield the greatest return. After removing the macro level impediments to the acquisition system, the basic framework within the current DoD 5000 series documents will support delivering to warfighters the critical capabilities they need to wage the wars of the future. The difference will be that we can support the framework with a capable system instead of an incapable one.

This report begins with a brief look at the evolution of DoD acquisition, focusing on the most recent acquisition reform efforts. It then makes a case for fundamental change. We discuss the system's future interface with industry, its "service" to the warfighter and the many contextual elements impacting its efficiency and effectiveness. We then discuss our main thesis—that the acquisition system needs fundamental reengineering—in detail. The Michael Hammer and James Champy approach to "reengineering" provides a basis for our work. We provide an in-depth discussion of the macro level processes that comprise today's overall acquisition system. We then cover in detail our proposal to improve the macro level acquisition system by focusing on the tenet of centralized control with decentralized execution within a joint framework.

Later we share results of our survey of US industry where we attempted to validate our precepts. We close with our vision of how to implement our proposed solution using a phased, methodical approach. It is important to note that our proposed solution is

outside the limits of current Title 10 guidelines. Our solution also requires amending certain federal statutes prior to implementation. We have also included a discussion of the potential political impediments to implementing any of the proposed changes. The paper concludes by summarizing our research and making recommendations for follow-on research.

## **Chapter 2—Acquisition: A Look Back in History**

### **Evolution of the Acquisition System**

The Department of Defense Acquisition Corps can trace its roots back to 16 June 1775. On that day, the Second Continental Congress passed a resolution establishing the Quartermaster General of the Army.<sup>2</sup> Since that day, the military services have spent billions of dollars acquiring goods and services in support of their national security mission.

As the weapons of war improved technologically, the complexities in managing them and the costs associated with acquiring them also increased greatly. In order to more effectively manage these new weapons, the policies, procedures and organizations with responsibility for acquiring them changed. The Joint Board of the Army and Navy was formed in 1903 to coordinate the activities of the services.<sup>3</sup> Though largely ineffectual, this group was the first legitimate attempt to jointly review military requirements, recognizing them as a key first step to joint military success. During the 1920's and the 1930's, Congress continued to study ways to administratively streamline the military departments but did not reach a consensus.

With the outbreak of World War II, the armed services organized numerous joint planning boards to manage the war planning process. These boards included the Army/Navy Munitions Board, the War Production Board, the National Defense Advisory Commission and the War Resources Board. Though there were several joint planning groups, the respective services still directed and controlled their own procurement functions. By 1945, it was apparent that the country could ill-afford to leave the War Department and

the Navy Department totally uncoordinated.<sup>4</sup> Though the services recognized the need for joint planning and execution and made attempts to force the matter, parochialism generally prevailed.

Organizational and procedural changes across the services since World War II have met with limited success at driving a joint approach to weapon system acquisition. The first major change took place with the National Security Act of 1947. This act unified the services and authorized the creation of the National Military Establishment (NME), which later became the DoD. Under this new structure, the service departments were of equal stature with the NME. In 1949 the service secretaries were removed from the Presidential Cabinet and placed under the authority of the Secretary of Defense (SECDEF).<sup>5</sup> There still was not much coordination among the services with regard to weapon system development programs. It was not until 1958, with the Department of Defense Reorganization Act, that the SECDEF was assigned responsibility for unifying service requirements.

In response to the United States' position as a world superpower and the growing DoD budget, President Dwight Eisenhower chartered the Commission on Organization of the Executive Branch of the Government in 1954.<sup>6</sup> This organization was commonly known as the Rockefeller Commission. A special task force of the Commission concentrated on defense procurement. The major recommendation of this task force was: "The Joint Chiefs of Staff organization is or should be the keystone of the procurement process in the Department of Defense as well as the vital focal point of broader national defense issues."<sup>7</sup>

It was also during this period that the DoD started to formalize its acquisition management practices. In 1955 the Robertson Committee was chartered to recommend changes in the acquisition system to promote efficiency and reduce acquisition lead time. The committee's report, published in July 1956, recommended that all departments establish offices with senior officers in charge of all necessary resources and that these offices be at high levels within the DoD.<sup>8</sup> In the 1960's, SECDEF Robert McNamara instituted the Planning, Programming and Budgeting System (PPBS). This system was an important step toward bringing the services together on establishing future needs and paying for them. However, because the system relies on service-peculiar inputs, the consolidated budget may leave gaps or produce overlap in addressing national security interests.

Another significant attempt at improving DoD acquisition came in 1981 under Deputy Secretary of Defense Frank Carlucci. The "Carlucci Initiatives" identified 32 areas for improvement in DoD acquisition. Probably the most notable was the emphasis on increasing competition in defense procurement. This initiative led to the Competition in Contracting Act of 1984 which established competition instead of sole source contracting as the primary method for obtaining goods and services in DoD.<sup>9</sup>

During the early 1980's, the press highlighted alleged deficiencies in DoD procurement. Spare parts' horror stories abounded, generating tremendous public outrage and significant Congressional attention. At Senate hearings before the Armed Services Committee, numerous key DoD and industry personnel were called to testify. Examples ranged from the AWACS stool cap costing \$1000, to the \$435 hammer, to the small screws the Air Force paid \$3 each, though having an off-the-shelf price of \$.28 per hundred.<sup>10</sup> Besides severely decreasing the public's trust in the military, these scandals re-

sulted in several additional layers of review added to even the simplest of procurements while doing nothing to address the systemic problems causing the high costs.

### **Latest Reform Attempts**

We can trace many recent changes in the DoD acquisition system to the Packard “Blue Ribbon” Commission, chartered in 1985 by President Ronald Reagan to look at a variety of defense management issues. Many of the commission’s recommendations were geared toward increasing the Office of the Secretary of Defense’s (OSD) visibility into program management and removing layers of unnecessary oversight.<sup>11</sup> Based upon the commission’s recommendations, the decision authority for DoD acquisition policy and strategy was brought under a newly created Under Secretary of Defense for Acquisition. The commission further recommended disbanding the Defense Systems Acquisition Review Council (DSARC) and creating a Defense Acquisition Board (DAB) to oversee the progress of specific weapon system programs. OSD oversight and the DAB remain at the heart of today’s defense acquisition system.

The Packard Commission further noted that program directors were spending far too much time briefing program status to functional staffs, service headquarters, OSD and Congress and not enough time doing “hands on” management of their program. It also noted that a program director had an exhaustive chain-of-command to climb in order to raise program issues through service leadership to the OSD. There was concern that the chain-of-command process might cover up serious issues, or worse, that issues might not get to the OSD level until it was too late to correct the problems. To counter this, the commission recommended reducing the program director’s chain-of-command to only two

people within the service prior to getting to the OSD.<sup>12</sup> Each service has since established Program Executive Officers (PEO) to address these concerns. In June 1989, SECDEF Richard Cheney set forth a plan to “implement” the results of the Packard Commission.

The 1989 Defense Management Review report brought about the first comprehensive documentation for DoD acquisition policy in the form of the DoD 5000 series directives. DoD acquisition management policies and procedures had traditionally been published in numerous separate publications. The documents were typically supplemented by the DoD components. Over time, this practice resulted in a heavily cross-referenced maze of guidance that stifled creativity and individual judgment and defied practical use.

The DoD 5000 series publications sought to remedy that problem by establishing a core of fundamental policies and procedures that can be implemented down to the program director and field operating command level without supplementation. The subject matter was condensed from over 45 separate DoD issuances that were canceled and countless DoD component publications that too were canceled.<sup>13</sup>

The National Defense Authorization Act of 1991 established the Advisory Panel on Streamlining and Codifying Acquisition Laws to develop recommendations on how best to streamline the DoD acquisition system. “Congress decided that the time had come to simplify the complex and costly process of acquiring military weapon systems.”<sup>14</sup> The goal of the panel was to review the acquisition system and make recommendations for improving the system that would 1) eliminate unnecessary laws; 2) ensure defense procurement process integrity; and 3) protect the DoD’s best interests.<sup>15</sup> The panel’s report, submitted to Congress in January 1993, recommended changes in almost 300 acquisition statutes, repealing 11 and amending 287 others. In general, its recommendations focused

on more effective integration of the military and civilian markets and removing the shackles of bureaucracy from the acquisition system.<sup>16</sup>

On 13 October 1994, President Bill Clinton signed into law the most recent acquisition reform measure, the Federal Acquisition Streamlining Act—a subset of the National Performance Review. The bill had its basis in a procurement reform package prepared by the Under Secretary of Defense for Acquisition, Office for Acquisition Reform, under the direction of Ms. Colleen Preston.<sup>17</sup> Additional legislation is being written and sponsored by Ms. Preston's office to be introduced later this year. It will impact DoD Fiscal Year (FY) 1996 authorizations and appropriations.

The Federal Acquisition and Streamlining Act expanded the number of contractors eligible for government work by removing some of the previous legislative barriers to government contracting. It changed more than 225 provisions to current government procurement laws; removed review requirements for purchases less than \$2500; raised small purchase thresholds from \$25,000 to \$100,000; relaxed rigid military specifications and gave greater decision making authority to acquisition program directors. Additionally, one of the prime motivations behind the Federal Acquisition Streamlining Act was to keep more industries involved in the defense business. This act included steps to facilitate the use of commercial technologies wherever feasible. It also encouraged the government to make use of readily available commercial products that meet requirements. This new law did not, by a long shot, answer all of either industry or government concerns regarding the way the government does business. The system remains incapable of consistently producing at acceptable levels of performance.

### **Chapter 3—The Case for Reengineering Acquisition**

The processes by which the US prepares for and executes war campaigns long ago broke ranks with the DoD acquisition system. Warfighters' needs are now often obsolete before a product is delivered. The threat very well may have changed by the time a new weapon system is fielded. Ten to twenty year development cycles mean that the warfighter can no longer count on the system to be a "player" in his planning and waging a future war campaign. It's time to streamline the acquisition system to the point that it once again plays a role in war planning. We cannot consider acquisition reform successful until the DoD acquisition customer can confidently ask for, and receive, products that meet his planning window. We can only achieve such a drastic reduction in development cycle time through radical thought and radical solutions. Any acquisition reform effort must result in the production of weapon systems 1) higher quality (greater reliability, less costly to maintain), 2) lower cost, 3) timely delivery and 4) greater performance.<sup>18</sup> Such reform has not yet been undertaken.

#### **What is Reengineering?**

Michael Hammer and James Champy popularized the term “reengineering” in their books, Reengineering the Corporation<sup>19</sup> and Reengineering Management.<sup>20</sup> They define reengineering as “the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical, contemporary measures of performance, such as cost, quality, service and speed.” The term describes a critical, self-examination proc-

ess used by a business to improve efficiency and effectiveness which, in turn, increases its profit margin. The ultimate goals of reengineering are to make the organization more focused on customer satisfaction and more competitive, hence more profitable, in the global market. Hammer and Champy cite numerous examples where reengineering greatly enhanced an organization's standing by dramatically improving product and service quality, reducing internal costs and improving customer responsiveness and satisfaction.

Reengineering yields revolutionary, instead of evolutionary or incremental, changes to an organization. Using reengineering principles, an organization becomes more efficient and effective by designing itself around key products or processes. Reengineering involves closely examining all current processes and functions, eliminating those that are unnecessary or non-value added and identifying those considered essential or fundamental. Further analysis of the essential processes will lead to the determination of the best or most efficient method to accomplish them. This may entail completely restructuring these processes to eliminate duplication and layers or combining and streamlining related functions. The end products of reengineering are simplified processes and flattened organizations.

As a result of reengineering, many organizations have shifted their philosophy from the antiquated assembly line style of business management to a process or product oriented approach. Employees of a successful 1990s manufacturing company no longer complete bite-sized, repetitive tasks that they then pass to the next work section in assembly line fashion. Instead, an empowered employee or team responsible for the entire product or process from start to finish. Employees develop a sense of process or product ownership and a stronger sense of corporate responsibility. Many of today's corporations

are using such a teaming approach to more effectively develop and produce tomorrow's consumer goods.

One example of a government organization's restructuring around process and product teams lies in Air Force Materiel Command's (AFMC) F-22 System Program Office (SPO). Since its inception, the SPO implemented the practice of forming product or process teams to manage weapon system acquisition programs. It chartered and empowered several Integrated Product Teams (IPT) to manage key processes or complete a "product" or portion of the aircraft's development—avionics, airframe, propulsion, etc.<sup>21</sup> The necessary functional expertise is present on each team (engineering, test, contracting, logistics, manufacturing, etc.) to independently manage the product from inception through sustainment. A comprehensive management information system controls and integrates the teams and facilitates cross-flow of information and data. The system also allows senior management to monitor the individual teams. The result has been increased cooperation and communication within the office responsible for developing and producing the next generation front-line fighter.

Before an organization starts its reengineering effort, Hammer and Champy call for two essentials: a case for action and a vision for the future. What is so wrong with the way we do business today? Hammer and Champy cite five required elements for making such a case: the business problem, the business context, marketplace demands, diagnostics and costs of inaction. This chapter will now present just such a case for action. Given a substantiated need for change, one then needs a vision for the future. What does an ideal DoD acquisition system really look like? Later in this chapter, we will provide our vision for an ideal future DoD acquisition system.

One might ask, why would a 1995 research group hang its hat on a term considered in some circles to be simply a passing buzzword? The term “reengineering,” after all, may well be out of “vogue” within years. The answer lies in reengineering’s sharp break with traditional approaches to process improvement. There is simply no better term to describe what we believe needs to be done to improve the DoD acquisition system. To those of you who will nevertheless cringe at the term “reengineering” each time you run across it in the remainder of this paper, we suggest you focus on four key underpinnings of the term: fundamental, radical, dramatic and process.<sup>22</sup> Long after the term “reengineering” is left to history, these pure tenets of sound improvement theory will survive and will continue to validate our approach to, and recommendations for, change in the DoD acquisition system.

### **The Business Problem**

The current DoD acquisition system is the result of years of incorporating many well-intentioned changes based on point solutions or concerns over real or imagined system abuses or weaknesses. Have the many changes, additional requirements, increases in bureaucracy and reforms really improved things? Or have they been bandages to an acquisition patient badly in need of major surgery? The system has always been bureaucratic (perhaps, excessively so) and cannot keep-up with the warfighters’ needs. It now takes so long to develop and produce weapon systems, and technology is changing at an ever quickening pace, that systems considered “beyond the state-of-the-art” when they were conceived are obsolete by the time they are provided to the warfighter.

With all the reform efforts put in place in the last 10 years alone, public confidence in the DoD process ought to be soaring. But, in fact, there is an ever increasing level of public outcry against the system, as typified by the US Speaker of the House Newt Gingrich's comments as he "turned his guns" on the Pentagon reform effort: "Don't try to reform the current [defense acquisition] system. It is hopeless. It is impossible."<sup>23</sup> Major weapon system development cycle time should be down. However, we have seen an increase to approximately 15 years on average from time of concept to initial operating capability.<sup>24</sup> The DoD's warfighting commands should be delighted. Yet, the Vice Chairman of the Joint Chiefs of Staff, Admiral William A. Owens, commented that the "... planning processes . . . are not sufficient to shape the joint military power which the future may require."<sup>25</sup> The cause is a DoD acquisition system defined by many of its own handlers as "broken." Clearly, one can find program successes, but these are more readily attributable to the superior leadership of the program director or blind luck than to the integrity of the acquisition system. Consider the following three joint program examples as evidence of the need for acquisition system improvement.

The need for an upgraded Combat Identification System within the North Atlantic Treaty Organization (NATO) became obvious in the mid 1970s. In January 1979, the Under Secretary of Defense (Research and Engineering) designated the Air Force as the lead service to develop a NATO identification system: the MARK XV. A November 1983 Air Force Audit Agency report on the MARK XV program found the program 1) did not meet each service's first priority for foe identification; 2) did not have tri-service approval of its proposed performance thresholds and goals; and 3) had no agreement on how the program's development costs should be shared across the services. The audit

report concluded that without resolution of these issues, the DSARC would not be able to make an informed decision on whether to commit resources to further MARK XV development.<sup>26</sup>

Basically, the DoD acquisition system did not force joint cooperation in MARK XV development. After years of muddling along, escalating costs were cited in the program's termination, but the root cause can be traced to little or no tri-service agreement on requirement definition. There is no question that the international aspects of the program complicated problem resolution. There is also little argument that a united DoD consensus on the issue would have bolstered the program's chances for success. The program, the critical need for which was identified by NATO in the mid-1970s, was ultimately canceled in 1991.<sup>27</sup>

In another case, both the Navy and the Air Force recognized in the late 1970s the need for an electronic defense system that could counter the increasingly sophisticated Soviet surface-to-air and air-to-air missile threats. The Navy was placed in charge of a joint program office to deliver the system, named the Airborne Self Protection Jammer (ASPJ), to the warfighters. "The objective was to provide maximum self-protection against a full spectrum of radar, including both coherent pulse-Doppler and continuous wave, without depending on escort jammer aircraft which might not be available."<sup>28</sup> The ASPJ program was plagued by accusations of waste, mismanagement and poor performance that resulted in close Congressional scrutiny throughout its development phase.<sup>29</sup> Though the services consistently validated the requirement for a defensive system, the developing and operating communities each interpreted the requirement differently. This lack of a singular in-

terpretation contributed directly to increased costs and schedule delays and spelled disaster for the program.

“The Air Force decided to withdraw from the program (in 1989), citing budgetary constraints.”<sup>30</sup> During Initial Operational Test and Evaluation (IOT&E), conducted in 1992, the ASPJ failed to meet one of its required measures of effectiveness (MOE). Citing this failure, the DoD IOT&E organization declared the system “operationally unsuitable” leading to the demise of the program.<sup>31</sup> Critics of this decision argue that the MOE did not accurately reflect operational requirements and that the IOT&E community “designed a test scenario that ensured failure.”<sup>32</sup> It matters little which argument is correct; the impact on the warfighter is the same. Today’s warfighter does not have the electronic defense system needed to counter sophisticated Soviet-made weapons that, due to the demise of Communist regime in Russia, are proliferating throughout the world.<sup>33</sup> Although requirements for the ASPJ were identified in the 1970s, industry experts predict the warfighter will not get the required protection until the 21st century.<sup>34</sup>

In the mid 1980s, Congress authorized a joint program named Tri-Service Standoff Attack Missile (TSSAM). Congress directed this joint program in order to ensure the three services had a common weapon system. Since the missile had to fire off eight different platforms and carry five different warheads, the individual services did not pursue a totally common design for the missile. At the Pentagon’s insistence, a fixed price contract for development was issued to Northrop Corporation. The program faced many challenges. “Making a stealthy missile was only one of them. TSAAM’s infrared seeker, which homes in on a target using complex signal processing algorithms; its navigation system, which draws on satellite global positioning data; and its control system, which in-

volves a series of intricate mechanical and electronic links, all had to be invented.”<sup>35</sup> The contract itself proved to be a problem because it was an effort at streamlining and was very vague in its requirements. After repeated delays and rising costs the Army dropped out of the program in 1993. The Clinton administration ended the program “after nine years of delays, contract disputes, failed tests and \$3.9 billion in taxpayer funds . . .” in early 1995.<sup>36</sup> There are many reasons cited for the failure of the program, but the services are taking blame for trying to execute service peculiar programs under the guise of a joint program which in turn significantly raised the cost and complexity of the program.<sup>37</sup>

World-wide, we are facing resource limitations that force us to constrain our strategy and planning in new ways. We must rethink the old methods of warfare: 5:1 force ratios, enormous mobilizations and prolonged overseas presence. The US defense acquisition system must plan and budget for the future better. It must react to validated needs faster and deliver needed capabilities sooner. We seem to be in a perpetual catch-up mode with existing shortfalls and mismatches resulting in gaps between national security strategy and force structure. We need to abandon the incremental approach to analysis and develop a new realistic, fact-based planning and budgeting process.<sup>38</sup> This will place an affordability constraint on national security strategy and, hopefully, make weapon system cost the dependent variable it needs to be in force structure planning and development.

Integrated planning and execution among all US services have become the battle cry of the joint warrior, but warfighters have suffered from almost no authority over the decisions to acquire their weapon systems and support structure. The Goldwater-Nichols Act of 1986 addressed this issue by inserting roles for the CJCS and the combatant commander. The act provides the Chairman of the JCS with a role in programming and budg-

eting by requiring him to “advise the SECDEF on the priorities of combatant commanders’ requirements and submit fiscally constrained alternative program and budget recommendations.”<sup>39</sup> The Reorganization Act also enhanced the combatant commanders’ influence over resource decisions by requiring them to “develop lists of their priority resource needs and requiring the military departments to indicate the extent of which these needs are being met.”<sup>40</sup> This was a good start, but we need more. Jacques Gansler, a noted author on defense related issues, discusses a strengthened role of OSD for policy and acquisition but emphasizes a greater role for the Joint Chiefs of Staff (JCS) to “. . . provide an integrated *military* viewpoint to balance the more parochial inputs of the services. . . .”<sup>41</sup> Admiral William A. Owens, Vice Chairman, Joint Chiefs of Staff, has already taken action to make this a reality through his efforts to strengthen the requirements process of the acquisition system. Admiral Owens describes a change to the process where he has “. . . expanded the scope and significance of the [Joint Requirements and Oversight Council (JROC)] discussions and linked them to the [Chairman’s Program Assessment] which, in turn, will . . . articulate the joint, collective position of the services.”<sup>42</sup>

With a greater centralization of the process for making acquisition decisions, we must then delegate responsibility to the lowest level. Norman Augustine, former Chairman and CEO of then Martin Marietta Corporation, suggested the traditional roles of Congress and OSD change. He stated that Congress should act more as a corporate board of directors, setting policy, strategic goals and allocating resources. Entanglement in day-to-day operations is not warranted. OSD should perform as the corporate staff, to allocate resources, oversee progress on specific projects and coordinate activities of its subsidiaries, the separate services. The services should assume the role of the operating

divisions in a large corporation, responsible for the day to day operations, and be held accountable for such.<sup>43</sup>

In their book War and Anti War, Alvin and Heidi Toffler, open with: “. . . as we transition from brute-force to brain-force economies, we also necessarily invent what can only be called ‘brain-force war.’”<sup>44</sup> In other words, as the way we make wealth changes radically from first wave (agrarian) through 2nd wave (industrial) to third wave (high tech), so must there be a change in the way we make war. Our acquisition system must also change to directly and effectively support the new way we make war. The key is not to become a victim of this change, but to be a catalyst of change.

### **The Business Context**

In addressing today’s DoD acquisition system shortfalls, it is critical that we understand the context within which its processes are to operate in the years ahead. The external environment will consist primarily of the US industrial and technological base. Business realities within the industrial base must be reflected in the reengineered DoD acquisition system. For the same reasons, how civilian and military laboratories and corporate research and development (R&D) teams deal with the rapid rate of technological change bear directly on how we should position the DoD acquisition system to exploit it.

With the end of the cold war, the industrial base is shrinking. Funding for R&D and corporate investment is drying up. The profitability formerly associated with lengthy production contracts is a thing of the past. The defense industry is attempting to adjust to these new realities. Many large corporations are consolidating to enhance their competitiveness both within the US and in the world market. In Europe, for example, joint ven-

tures and other partnerships will proliferate, buttressed by Europe's various forms of industrial policy. Some industry officials and aerospace analysts in Europe foresee a pan-European aerospace industry within 10 years. The pooling of economic and technological resources would enable countries to compete for a larger market share worldwide.<sup>45</sup> Pressures to become active in the consolidation process will increase. Factors as basic as the enhanced purchasing power that comes with economies of scale will give larger companies a price advantage. Here in the US, Martin Marietta and Lockheed recently consolidated, creating the world's largest defense company. This merger follows one recently completed by Hughes Aircraft Company and General Dynamics' tactical missile division. Hughes consolidated five facilities into one, driving utilization to 85 percent from 35 percent and obtaining a price advantage on the advanced medium range air-to-air missile (AMRAAM) production to beat Raytheon Company in a major competition.<sup>46</sup> The consolidation of the defense industry raises tricky questions for the government about how to award future contracts. "When there are only one or two suppliers for each type of weapon, the amount of competition for new contracts is clearly going to be limited. America's anti-trust laws were never designed for such a shake out."<sup>47</sup>

Where consolidation is not viable, the industry is downsizing. The primary method of downsizing is to sell off the less profitable assets within the company. General Electric got rid of its aerospace subsidiary to Martin Marietta. Ford sold its aerospace division to Loral. IBM disposed of its defense-computing unit also to Loral. Conglomerates such as Westinghouse, ITT and Textron all reputedly intend to unbundle their defense assets.<sup>48</sup>

Pentagon analysts expect that no fewer than 80 of America's top 100 defense firms will have quit the field by the end of the decade. America is likely to have only two mak-

ers of military aircraft—McDonnell Douglas and Lockheed. Northrop may yet survive as a subcontractor, aided by its commercial business with Boeing. The eight suppliers of military satellites may dwindle to two or three—Hughes, Martin Marietta and possibly TRW. The number of missile makers will likely decrease to just two, Hughes and Raytheon.<sup>49</sup> However, both these companies recently formed a joint venture to produce the Navy's new missile.<sup>50</sup> The venture guarantees them a steady work base without the hassle of yearly competitions experienced with the AMRAAM program.

In a bit of an irony, the US technological base is in a rapid state of decline while the rate of advancements in technology increases. The defense acquisition system will have to be even more adaptive, flexible and innovative to meet this challenge. A future acquisition system will have to be adept at the transfer of R&D programs from beyond military sources, to include work being done outside the US.<sup>51</sup>

The DoD acquisition system must account for the above realities to ensure it can exploit and deliver advanced technology to warfighters for military operations. In turn, DoD processes must exploit a military-technical revolution (MTR)—similar in concept to the RMA addressed by Admiral Owens. According to Andrew Krepenivich who has written extensively on the subject out of the Office of Net Assessment, “A Military-Technical Revolution occurs when the application of new technologies into military systems combines with innovative operational concepts and organizational adaptation to alter fundamentally the character and conduct of military operations.”<sup>52</sup> In other words a new technology can totally dominate and defeat the enemy, like the Nazi's application of armor and airpower in the blitzkrieg tactic of WWII. Such exploitation of an advanced technol-

ogy break-through must be fast enough to counter very dynamic threat scenarios before the enemy can develop countermeasures.

### **Marketplace Demand**

Any team of construction workers would be foolish to not consider the future needs of the building's occupants. As such, the acquisition community must consider the changing needs of its warfighting customers throughout its reengineering of the system. After all, it is future US military dominance on the battlefield that ultimately will determine the success or failure of the acquisition community.

A variety of sources, ranging from studies commissioned by the individual services and formal documents from the JCS to the futuristic concepts in the Toffler's War and Anti-War,<sup>53</sup> produce two common threads about the future of the US military force. One is the need for a flexible military due to rapidly changing future threats. The other is the need for efficiency as the US military will continue to be resource constrained. We do not anticipate seeing big, "Reagan-years" budgets again.

We can expect the US military of the future to be a reflection of threats based on the geopolitical, economic and technological situation in the world of the future. There are several ideas on what these threats might be. Richard Carlson and Bruce Goldman, well established authors and futurists, forecast that a nation's future power will be based on its economic and technological position relative to other nations. They also think that military power will no longer determine which nations will be global powers. Japan might be in such a position now. Carlson and Goldman think the emerging global powers are Europe, Japan and, after re-unification, Korea. Due to the stabilizing influence of bu-

reaucracies, they also believe wars will tend to occur in developing countries as a result of local police actions or protection from countries trying to become regional powers.<sup>54</sup>

Along similar lines, Mark Eitelberg and Stephen Mahay, respected military authors, believe wars will be between the “have nots” fighting the “haves” in an economic sense.<sup>55</sup>

Therefore wars might be fought over scarce resources such as water or oil. Clear threats to US national interests no longer exist. Instead, the threat environment will become very broad and nebulous.

Military sources generally agree that location and type of military operations will remain unpredictable and varied. The US may be involved in operations against enemies that are not states, such as organizations like drug cartels and terrorist groups. We can also expect to continue our nontraditional military operations such as the support provided after Hurricane Andrew. Some suggest that the current two major regional conflict (MRC) planning document gives insufficient attention to operations other than war that are becoming a more significant part of annual operations. Others believe that over involvement in military operations other than war (MOOTW) could severely degrade the US ability to meet a two MRC scenario.<sup>56</sup> Flexibility clearly becomes even more a key to future military success.

In the future, one can expect coalition and allied operations to be the norm, with US unilateral operations in other nations very unusual. Carlson and Goldman state that Europe will have to assist the US as the world’s policeman because US force structure will be too small to support any large operation alone.<sup>57</sup> They also maintain that megastates will develop joint military forces as very few nations will be able to economically afford large standing armies.<sup>58</sup> The possibility does exist for two megastate forces to engage

in hostilities. Beyond involvement in these war or conflict type operations, US forces will be expected to participate in diverse operations other than war with other nations.

Joint operations will also be the norm rather than the exception for the US military of the future. As a primarily CONUS-based military; US air, land and sea forces are becoming more and more dependent on each other. In peacekeeping operations, the Army relies on both the Air Force and Navy for lift and sustainment support. In limited war and conflict, each service can provide unique capabilities for integration into a variety of combinations to counter the air, ground and naval forces of other nations and emerging threats.

The impact of technology on the military structure will vary. The declining rate at which the US integrates high-technology into modern weapon systems, coupled with the proliferation of higher technology weaponry to third-world nations, means an erosion of the technological advantage the US has long enjoyed. This may be mitigated by a country's inability to systematically exploit the technology it has acquired. According to Eitelberg and Mahay, weapon lethality will increase. They believe military acquisition should strive to minimize the forces in battle since use of chemical and biological agents will increase.<sup>59</sup> Robotics will receive an increased emphasis. The Tofflers on the other hand believe in pursuing nonlethal weapons that, like any weapon in the wrong hands, could be devastating.<sup>60</sup> The Army's position, as the Toffler's theorized for third wave states, is that in a conflict or war, the side with the best information and fastest ability to respond to that information will have the edge.<sup>61</sup>

We must further expect technology to have a significant impact in the area of simulations. These simulations will be undertaken for a variety of purposes. Not only will

simulations be used for wargaming, but they will assist in the acquisition of weapon systems and testing of new doctrine as well as training, particularly in command post exercises. Virtual reality training is not just a concept. It is in use now. A pilot or a gunner can now train on any piece of land, for which we have digitized mapping, without ever leaving the United States. We can expect the use of simulations by the US military to expand as computer technology continues to improve.<sup>62</sup>

## **Diagnostics**

In statistical process control terminology, the DoD acquisition system is “out of control.” The many recent reflex reactions to “fix” the problems are actually compounding it. This tampering with the system only makes matters worse, while the real problem goes unsolved. Users, contractors, and program offices alike, add insult to injury by inventing “workarounds” to inadequate processes in often vain attempts at delivering what the customer wants, on schedule, under budget. The system requires radical change. What is needed “isn’t how to improve slightly on the McNamara legacy” said US Speaker of the House, Newt Gingrich.<sup>63</sup> We must redesign the system’s processes to bring them under control to where the system’s output is consistently within acceptable limits.

W. Edward Deming, a recognized expert in statistical process control and quality improvement, cites two types of unacceptable process variation: special cause and common cause.<sup>64</sup> Special causes are ones that management must eliminate in order to bring the process under control. Common causes are a function of the process itself, are within the control of the process owners, and must be eliminated for the sake of process improvement. With regard to the DoD acquisition system, it is not enough to stabilize the

processes by simply eliminating special causes. Common cause variation should be the target of continuous process improvement. After all, who needs a process that results in 15 year cycle times—even if it does so consistently?

Not only has such process improvement never been attempted in the acquisition community, the requirement to do so has gone largely unrecognized. Until program directors take such steps, they will continue to fight an uphill battle to develop and produce weapon systems within constraints imposed by an acquisition system that is out of control. The requirement for a fundamental process-oriented approach to reengineering DoD acquisition is best summarized by Mr. Norman Augustine, then Chairman and Chief Executive Officer of Martin-Marietta Corporation:

“The solution to acquisition problems encountered in the past has too often been simply to promulgate regulations insisting that whatever problem has occurred never ever occur again. The resulting body of procurement “law” has therefore been evolutionary — rather than being a product of a carefully considered, “zero-based” effort to determine how best to manage military research, development, procurement and support successfully.”<sup>65</sup>

### **Costs of Inaction**

These challenges appear daunting indeed. The task of developing any system to overcome these problems can appear so overwhelming that it might seem as though leaving the current system as it stands would be a more prudent course. The failure to act decisively now, however, will only result in more chaos in the future. In fact, some feel that if we allow the defense acquisition system to proceed down an unaltered path, the threat of unmanageable cost and unacceptable development time will become an inexorable reality. Norman Augustine estimates that “in the year 2054, the entire defense budget will

purchase just one aircraft” and it will take the entire gross national product to buy an aircraft in the year 2150.<sup>66</sup>

In more specific terms, Jacques Gansler feels that there are opportunities to save up to \$50 billion, through major, radical changes to the acquisition system. By eliminating redundant R&D and production programs between services, he projects annual savings on the order of 5 percent of the acquisition budget. Gansler also contends the DoD could realize annual savings on the order of 10 percent of overall production costs while reducing full scale development cycle time by nearly 5 percent simply by breaking away from traditional weapon types or designs and embracing advanced technology in non-traditional, non-parochial (joint) equipment and capabilities.<sup>67</sup>

Another ramification of not pursuing radical change in current acquisition system is the threat of the US losing its technological edge. The loss of the technological advantage can come from a variety of sources: the inability to integrate military missions and needs with the technology generation process; the inability to properly flow technology to the warfighters fast enough; or the inability to generate a level of technology in the industrial base because its capacity to sustain advancements in military capability has been shattered. As Admiral Owens stated, our current acquisition process is geared more toward the “old” global order based on threats posed by another superpower. He continued, “[It is now], in extending America’s leading edge of military capabilities, that past experience may be the least helpful and the need to alter the old way of doing things the greatest”. Without this perspective, it will be nearly impossible to build the “force of the future” and harness the “revolution in military affairs brought about by [leaps in technology]”.<sup>68</sup>

## **Vision**

US Speaker of the House, Newt Gingrich well summarizes the bottom-line for the DoD acquisition system.

“What the Pentagon needs is a system of developing and buying gear that keeps the US military a generation ahead of its contemporaries”.<sup>69</sup>

An ideal system would efficiently turn warfighter requirements into weapon systems. It would do so in a span of time short enough so as to bring new capabilities to bear in war-fighting before anticipated threats change. CINCs should be able to count on the acquisition system to deliver within current war planning cycles. An ideal system would effectively “push” technology into new weapon systems while responding to warfighter requirements or customer “pull.” It must be consistent in its output: on-time, under budget weapon systems deliveries that meet the warfighters’ performance requirements. Moreover, the future acquisition system must prove itself worthy of taxpayers’ dollars by showing a clear return on investment through efficient and effective operations. The DoD acquisition system should meet the needs of the warfighter and the American public.

## **Chapter 4—Assessment/Analysis of the Acquisition System**

Thus far we presented a brief evolution of the DoD acquisition system. Over the years, additional legislation and policies, reporting requirements and oversight have been layered onto the system in the name of acquisition reform or as an automatic reaction to programmatic mistakes or failures. It is readily apparent, however, that the cumulative result of these regulated changes left the DoD with a system that is neither reformed nor immune to programmatic horror stories. Worse, these changes created an acquisition system that is not capable of consistently producing new systems that meet warfighters' needs. Cost overruns and schedule delays are the rule rather than the exception.

In the future, the pace of technology, the speed and fluidity of warfare and an even more austere budget environment will demand an acquisition system that is more flexible and responsive. We will no longer be able to allow service parochialism and myopia to drive procurements. Funded programs must address critically required capabilities, broad cross service (joint) combat enhancements, and revolutionary warfighting techniques.

We need to fully understand our present processes so we can shape a system that will meet these future needs. As such, in this chapter we will apply the concepts of reengineering to identify the essential processes within the current system that we should retain for the future. We analyze these processes on a conceptual basis and use the results to form the framework of a reengineered acquisition system.

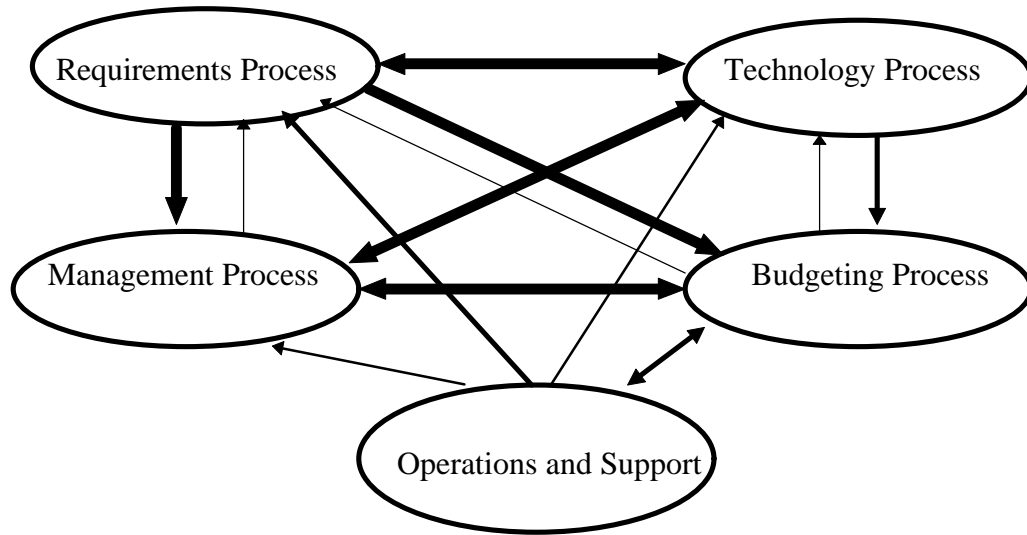
## **The Essential Acquisition System**

Reengineering defense acquisition is a daunting task. The scope of the system is extremely broad and the details immensely complicated. Witness the thousands of pages of laws, regulations, instructions, and policies that are the framework for defense acquisition. This research takes a narrow horizontal slice across the top of acquisition. We focus on the fundamental macro processes and top-level control mechanisms. We assess and analyze these critical parts of the system as a basis for our recommendations to improve the methods by which the DoD procures capabilities for the warfighter.

At the macro level, weapon system acquisition is the convergence of five fundamental, interdependent and concurrent processes: requirements, technology, budgeting, management, and operations and support (O&S). The CINCs and services use the requirements process to determine, validate and document mission deficiencies and forecast future mission capability shortfalls. Through the technology process, the DoD develops and transitions new ideas into potential defense system applications. The services request funding for current operations and forecast future resource requirements through the budgeting process. Through the management process, discipline is applied to turn acquisition program baselines into weapon systems within established cost, schedule and performance thresholds. The services use the O&S process to sustain day-to-day operations of the forces and equipment in the field.

Figure 1 is an interrelationship digraph that depicts the interaction and interdependence of the five fundamental macro processes. Some processes, such as the requirements process, are predominantly drivers. Others, such as the O&S process, are more

subordinate. Each process can dominate and dictate the course of a specific acquisition program depending on the situation and the stage of program development.



**Figure 1: Interrelationship Digraph—Acquisition system**

Those processes depicted by the thick, bi-directional arrows are strongly interdependent. This graphically demonstrates the futility involved in any attempt to fix defense acquisition by focusing on one process alone. The digraph also demonstrates the importance of considering the impact a change in any one process may have on other processes and hence the system as a whole. Changes in the management process alone, such as those undertaken in previous and on-going reform efforts, may improve the efficiency and effectiveness of the management process itself. However, these are small, evolutionary changes within a much larger and complex acquisition system. A change that improves the oversight of the management process may impact the budgeting process, such as the legislation changing the rules of engagement regarding use of “m” account funds to cover outstanding program liability. Clearly, any possible fix to the problems of defense acqui-

tion system should consider the effects on all five interdependent macro processes. The potential solution has to offer more than process improvement, it must also improve process integration.

Every acquisition program has a unique set of circumstances and forcing functions associated with it. These affect the manner in which the five interrelated processes are executed. They will drive the tailoring of the acquisition strategy and development cycle to optimize chances for success and minimize risk. Forcing functions can and frequently do change during the development cycle creating instability and potential programmatic restructures. These restructures almost always result in cost growth and schedule delays.

For example, a Presidential Directive in 1983 established the Strategic Defense Initiative to develop a national missile defense capability. One forcing function was the requirement for defense against global ballistic missile attack and certain key technologies, such as kinetic energy weapons, space-based lasers, etc. The Scud missile events of the Gulf War and the defense drawdown brought about by the end of the cold war changed this forcing function. The principle requirement is now a mobile or transportable theater-based ballistic missile defense capability. The changed requirement dramatically altered the set of potential solutions. Originally planned as a system of space-based and fixed CONUS-based systems with a capability to defeat intercontinental threats, it must now be a flexible, deployable system capable against a wider variety of intercontinental and short range missile threats. The budget, although always an important consideration, is now a predominant driver.

The defense drawdown eliminated the DoD's flexibility to develop alternative technologies or weapon systems that are not absolutely essential and clearly relevant to

current and projected defense deficiencies. This leaves acquisition program directors little or no reserve and very limited flexibility to pursue risk reduction activities or alternative technologies and redundant capabilities. Changing forcing functions and continued program instabilities make the case even stronger for sound management practices, underpinned by a completely reengineered acquisition system.

As we continue we will take a more detailed look into the five fundamental macro processes in an effort to identify key functions and essential sub-processes. Along our road to reengineering, we will then draw upon this assessment to bolster process weaknesses, weed out redundancies, and integrate for efficiency.

### **The Requirements Process**

The requirements process involves a thorough examination of future mission requirements, deficiencies and necessary capabilities. The overarching Air Force requirements process is known as the Modernization Planning Process (MPP). MPP includes intensive mission area analysis (MAA) involving detailed threat analysis and modeling and simulation to forecast operational deficiencies. One common technique for conducting an MAA is the strategy-to-task methodology.<sup>70</sup> Based on long range guidance, future strategies are forecast and divided into discrete tasks, functions, and capabilities necessary to accomplish the strategy. Weapon system capabilities are then matched against these discrete tasks. The analysis includes projecting threats. The outcome is a proposed force structure to accomplish the strategies. The process identifies mission and weapon system deficiencies with regard to the current force structure. The analyst then examines these deficiencies to determine if changes in tactics and doctrine can satisfy them. If not, the

deficiency is a documented mission need. The requirements process is typically the initial step in a weapon system acquisition system. An essential product of the requirements process is a validated mission need, documented in the Mission Need Statement (MNS) and expressed in broad operational terms.<sup>71</sup> For potential new major defense acquisition programs,<sup>72</sup> the JROC must approve and validate the MNS.<sup>73</sup> If the decision is to initiate an acquisition, a system specification evolves based on the requirements stated in the MNS and its derivative, the Operational Requirements Document.

The requirements process is frequently a major cause for program instability—gold plating, unrealistic requirements, implied or incomplete requirements, requirements changes or requirements creep, etc. Clear, unambiguous, achievable, affordable, and stable requirements characterize successful programs. This necessarily implies a high degree of mutual understanding, coordination, and communication between the users and the acquirers. It is also critical for users to remain committed to the acquisition effort once initiated. This requires the users to adopt and maintain a broad, long-range focus during the requirements process and advocate future capabilities that are flexible in face of multiple contingencies.

A common problem in the requirements process is the propensity for users to specify system requirements instead of needed military capability. This stems from the parochial nature of the requirements processes within the services and their requirements generation organizations. For example, the Air Force may document a mission deficiency to strike strategic mobile targets. The MNS might address the need for a bomber with certain requisite characteristics: stealth, range, payload, real-time intelligence in the cockpit, etc. In addition, the MNS may specify the need for capabilities to deliver precision

guided munitions, stand-off weapons, and dumb-bombs. In effect the user, through the MNS, engineered a solution to the mission deficiency. The user preordained the only acceptable solution and by doing so locked in the costs, the pool of contractors (which thereby implies a certain Congressional constituency), and obviated any examination of alternatives.

In some instances this technique of identifying system specific mission needs will lead to a more rapid fielding of new capabilities. This may be acceptable when we urgently need new capabilities to address immediate national security shortfalls. As a rule, however, the MNS should address the mission deficiency. In this example, the mission deficiency is the inability to strike strategic mobile targets. The acquisition community and the industrial base should have a free hand to examine a range of options and determine the best alternative(s) to address the deficiency. This is not to imply the acquisition community should make the final decision on future weapon system developments. That decision rightfully belongs to the warfighters. Rather, the acquisition community should examine and present alternatives to the users in terms of cost (acquisition and life cycle), schedule, and performance (including supportability).

Other than JROC validation, the current requirements process is unfortunately conducted in “joint isolation.” As discussed, individual services (major commands) and agencies are parochial, performing their own MAA, confining the potential solution set to the types of missions and equipment indigenous to their organizations. The Air Combat Command (ACC) mindset might be to acquire future weapon systems employable by ACC. Following the example above, ACC might choose a B-2 or F-22 with appropriate surveillance, targeting, and munitions’ delivery capabilities to destroy strategic mobile tar-

gets. It may give little consideration to potentially more efficient or effective solutions offered by other services or organizations.

The inter-service conflict over roles and missions only increases the fog and friction already inherent in the requirements process. A recent example of such parochialism is the debate between the Army and Air Force regarding the deep battle mission.<sup>74</sup> At stake is the Army's multi-billion dollar Attack Missile System (ATACMS). The Army identified a need to degrade the effectiveness of the second echelon forces to impede their ability to reinforce the troops on the front line of the battle. The Army is currently developing an upgrade to the ATACMS to meet that need to shape the battlefield. It is intended to complement current shorter range artillery and rocket systems.

On the other hand, the Air Force argues ATACMS is essentially a duplication of the capabilities of deep strike fighter and bomber aircraft with precision guided munitions (PGM). The Air Force maintains that an aircraft with PGMs is more efficient and economical since an aircraft is reusable and PGMs are relatively cheap. Such inter-service debates are important from an intellectual standpoint. However, such service parochialism impedes the acquisition community's ability to promptly fielding of a system capable of meeting the identified need for accurate deep strike capability.

The essential function of the requirements process is determining valid operational mission deficiencies through MAA. The critical missing function in the current process is joint analysis. Joint analysis is required to perform trade-offs between all service capabilities and potential weapon systems against the needed military capability. This may require an elaborate capability to perform joint modeling and simulation to wargame a variety of permutations and potential solutions. A cost benefit analysis of the more viable alterna-

tives may further reduce uncertainty as to the best solution(s) to satisfy the mission need. It might simply require a tri-service sanity check.

Conducting joint analysis of all service mission needs for the purpose of making investment decisions is equivalent to gaining centralized control of the requirements process. Using the analogy of the JFC, Desert Storm revalidated the synergy achieved through centralized control and decentralized execution of a joint campaign. During Desert Storm the JFC had the luxury of numerical advantage. General H. Norman Schwarzkopf had more than enough military power to accomplish the mission. Even in this situation, the US obtained important synergies through centrally controlling the campaigns. Centralized control becomes even more critical when there is a shortage of assets. The US must make hard decisions as to where to best employ the limited resources available on the future battlefield. Likewise in acquisition, hard decisions must be made at a joint level as to what systems to procure in order to meet the highest priority capability shortfalls. The need for a single controlling and decision making body is evident in both cases.

Review of the requirements process yields the following general recommendations for a reengineered requirements process:

- A. Determine warfighter operational deficiencies by employing a joint systematic MAA methodology.
- B. State warfighter deficiencies identified through MAA, in terms of needed military capability, instead of weapon system specific terms.
- C. Validate warfighter deficiencies jointly to avoid service parochialism.
- D. Centralize joint validation authority at a high level to ensure control.

## **The Technology Process**

The technology process is characterized by exploratory, basic and advanced research in technologies relevant to defense applications. The primary players are defense

laboratories, defense industry Independent Research and Development (IR&D), commercial industry, universities, and allied development agencies. The technology process can also be the impetus for a new weapon system acquisition. Breakthroughs in technologies may offer exciting new weapon system capabilities or efficiencies that can be the seed for new acquisition programs. The technology process itself is not likely a major cause for failure of the acquisition system. Although some ill-fated programs relied on technological breakthroughs, which occurred later in time or not at all, their demise is not readily traced to a lone fault of the technology process. It is however, a contribution to the poor overall performance of the acquisition system.

The essential function of technology development is the identification of promising new technologies that may have force multiplying, combat enhancement properties. Forecasting breakthroughs in technology is akin to scientific prospecting. It requires the skills of a scientific visionary and a futurist warrior. The key is to match future technologies with projected mission requirements for the near and distant future. Today, the reduction in resources and increased budgetary scrutiny further complicates this challenge. In order for technology initiatives to survive the budget battles, they must be relevant to some high potential combat application (retail) or offer other broad-based improvements and efficiencies to combat capabilities (wholesale). Technology is critical to maintaining our warfighting edge.

The technology process is very dynamic. Its management differs widely among services and agencies. The Air Force and Army use a management tool, known as the Technology Master Process (TMP).<sup>75</sup> This offers tremendous potential to guide and focus the development of science and technology to address current and forecasted warfighting

deficiencies. The TMP applies a structured discipline to the art of scientific prospecting by coordinating ongoing and proposed technology initiatives with the warfighters' requirements process. The Air Force TMP specifically requires the warfighter and the support community to assess the relevance of technology initiatives to the full set of mission area deficiencies. Similarly, senior scientists and technologists grade the quality of the science inherent in these technology initiatives. The process identifies those initiatives that show high promise scientifically and address forecasted warfighter mission needs (wholesale or retail). Other initiatives are rescope or terminated. The recent marriage of technology and requirements through TMP and the aforementioned MPP process is a model for efficiently managing technology development to meet future warfighter needs in an austere budgetary environment. Within the Air Force, as TMP and MPP continue to mature, they ensure prioritization of technology initiatives and technology insertion yielding an ever tightening understanding and appreciation between warfighters and scientists.

Unfortunately, the joint arena does not systematically apply this disciplined approach to matching technology development to warfighter requirements. Implemented in a joint environment, such an approach would optimize investments in technology. Warfighters could gain valuable insight into emerging and potential new technologies. This would enable warfighters to consider broader possibilities while conducting mission area analysis and perhaps envision (advocate) efficient new technology solutions for mission area deficiencies.

Some advocate that the acquisition community should push technology to the warfighters. As the world's undisputed leader in high technology, the US should be "the threat," forcing its potential enemies to constantly react to its leading edge weapon sys-

tems and employment tactics.<sup>76</sup> Technology development based on technology push is in direct opposition to basing technology development on forecasted warfighter deficiencies, or using requirements to pull technology development. However, many important advances in weaponry and combat systems are attributed to technology push. For example, the laser guided bomb, Global Positioning System navigation, and airborne command and control aircraft (AWACS) are all examples of capabilities brought forth through technology push.<sup>77</sup> Early on, warfighters were reluctant to advocate and invest in these technologies until proven feasible.

On the other hand, technology push can have negative consequences. It may drown in its own inertia where sunk costs and past advocacy dictate continued development. The warfighter is forced to accept and employ technical gadgetry that provides new capability, but may not necessarily be what he requires or desires. An unfortunate characteristic of the defense acquisition system is that once a program begins, it takes on a life of its own. This is the consequence of many contributing factors like sunk costs, a large bureaucracy, warfighter interest in greater combat capability (even when no explicit deficiency exists), Congressional “local” interests, contractor lobbies, etc. The result is often useful new capability, but perhaps not the most efficient or effective expenditure of resources. While there is merit in the potential breakthroughs achievable by conducting science for the sake of science, the contextual reality is that future budgets will prohibit expenditure of resources on science that has no clear retail or wholesale application. As such, the reengineered technology process should facilitate the use of both customer pull and technology push in driving future technology development and insertion.

Technology may also result in new weapon systems or capabilities that the warfighter does not have the proper doctrine to employ. As noted by retired Brigadier General Don Morelli;<sup>78</sup> “The American military’s biggest problem? It let technology drive strategy, rather than letting strategy determine technology.” While this may be an overstatement, unchecked technology development can result in combat capabilities that we cannot or will not employ.<sup>79</sup> Just as important as providing new technology and weapon systems to the warfighters is ensuring the technology is something they both need and want, and they have the organizational structure and doctrine to employ it once delivered. New technology, coupled with the appropriate organizational structure and revised warfighting doctrine are the necessary ingredients for a MTR.<sup>80</sup>

History is replete with examples where new technology and weapon systems were developed for the warfighter but, because of organizational barriers and archaic or stale doctrine, were not employed to maximum advantage. For example, consider the longbow and the tank. When first introduced, the warfighter did not recognize these new technologies and weapon systems as revolutionary. These new capabilities were “force fit” into existing organizational structures and employed in the context of existing doctrine yielding marginal improvements in combat effectivity. It required many years of operational employment and experimentation for the warfighter to recognize their true force multiplying capabilities. It required a revised organizational structure to accommodate the new weapon systems and new doctrine to exploit these capabilities to their fullest potential. For the longbow, this process took over 200 years.<sup>81</sup> France’s failure to recognize the revolution in maneuver warfare brought about by the tank cost it much blood and eventual capitulation to Nazi Germany.

Establishing or revising the warfighters' organization and doctrine is not the business of the acquisition professional. However, there is clearly the need for the acquisition professional to understand both in order to accurately translate warfighter requirements into contractual specifications. This interplay between the warfighter and the acquisition professional must be two-way, specifically with regard to technology development. A closed-loop process that facilitates and encourages organizational and doctrinal review with proposed new weapon systems, technological developments, and innovations will aid this interplay. The warfighter could then consider and create appropriate operational doctrine accommodating organizational structures for new weapon systems and technologies. A process of this nature will ensure exploitation to the maximum degree on deployment of these new capabilities.

Like the requirements process, assessments on which technology initiatives to pursue, are being done in "joint isolation." There appears no systematic process that manages technology development with an eye toward jointness. The present process is ad hoc in nature, relying on networking within the scientific community to make connections with different potential customers or users. In general, the OSD, the Defense Science Board, and the Joint Director of Laboratories provide some top-down guidance and coordination. However, there appears no concerted, continuous review process to direct, balance, and prioritize technology development to meet the widest needs of a joint fighting force.

For example, the Air Force may be developing revolutionary digital signal processing techniques in imaging for certain space applications. These techniques may be just as relevant to Navy requirements for acoustic detection, or Special Operations Forces requirements for image recognition with night vision equipment. While separate initiatives

may lead to multiple breakthroughs, it is an inefficient use of resources and may later result in interoperability problems in certain mission areas. An agency or service may be completely unaware of developments already funded and completed by other services that could fulfill their technical requirements and speed the development cycle and reduce costs.

Review of the technology process yields the following general recommendations for a reengineered technology process:

- A. Link technology development to the requirements process. Focus technology to address valid warfighter mission deficiencies. The foundation must be customer requirements, i.e., customer pull.
- B. Accommodate technology push, especially in instances where we can achieve revolutionary advances in combat capability (wholesale or retail).
- C. Optimize technology investments in a joint environment.
- D. Integrate technology investment decisions with a centrally controlled requirements process.
- E. Review technology insertion with regard to doctrine and warfighter organization to ensure technology exploitation on deployment.

## **The Budgeting Process**

The budgeting process is used by the services to forecast and request funding. “The objective of the federal budget process is the efficient management of programs in relation to the requirements of the nation”.<sup>82</sup> The PPBS encompasses the overarching processes the DoD uses to marry the needs of the services with the available resources. It is “. . . both the DoD resource management system and the budget formulation decision tool of the budget process”.<sup>83</sup> In accordance with DoD Directive (DoDD) 7045.14, “. . . the ultimate objective of the PPBS is to provide the best mix of forces, equipment and support attainable within fiscal constraints”.<sup>84</sup>

As the name implies, the basic building blocks of planning, programming and budgeting form the cornerstones of the PPBS process. The process itself is deeply rooted in the DoD's ultimate objective of providing security for the nation. The process adheres to a sequential flow of events that enables the DoD to translate broad national security objectives into narrowly defined requirements for resources to meet the objectives.

“Based on the anticipated threat, a national defense strategy is developed. In support of that strategy, force requirements are planned to achieve the desired force structure. Based on those requirements, programs are developed to provide, on an orderly basis, weapon systems and manpower, over a period of time, for a desired force structure, with due consideration of the total cost to the nation. Lastly, funds must be budgeted to obtain the required forces and weapon systems within the resources the nation provides”.<sup>85</sup>

The first step in the PPBS process is the planning phase. The objective of the planning phase is to assess the threat and determine, at a high level, the forces needed to counter it.<sup>86</sup> “National security policy (as well as interpretations in national military strategy and other inputs from the Joint Staff, CINCs and services) provides the basis from which the OSD develops the Defense Planning Guidance (DPG). The DPG provides OSD guidance to the services for the Program Objective Memorandum (POM) development, making the DPG the OSD link between the planning and programming phases. The DPG provides the SECDEF's fiscally constrained guidance on policy, strategy, force planning and resource planning for all DoD organizations. All DoD players contribute to DPG development. The DPG is the yardstick for making programming and budgeting decisions. Services develop their program proposals in accordance with the DPG while OSD and the Joint Staff use it as the baseline for program review”.<sup>87</sup>

The second step in the PPBS process is the programming phase. This is the point in the PPBS process where the (service components) match available resources (fiscal, manpower, etc.) against validated requirements. This phase addresses policies and guidance issued during the planning phase.<sup>88</sup> The services provide this information to OSD as their POM submission. “The POM identifies total program requirements for the next six years (as constrained by OSD guidance) and includes rationale for planned changes. A key objective of POM development is to provide requisite capabilities and meet critical needs within a balanced program weighted by mission area needs. Several types of balance are essential—among mission areas, between force structure and support and between current and future capabilities”.<sup>89</sup>

“The CINCs, Joint Staff, OSD staff and Office of Management and Budget (OMB) staff review all service POMs during the OSD program review phase. The reviewers develop alternatives to selected programs in the POM”.<sup>90</sup> “After the SECDEF reviews and approves the program, it becomes the basis for budgeting action. Programming actions are summarized and published in the Future Years Defense Program (FYDP)”.<sup>91</sup> “The FYDP is the official document that records, summarizes and displays the decisions approved by the SECDEF as constituting the DoD program. It provides a detailed compilation of the total resources (forces, manpower, procurement, construction, research and development and operations and maintenance dollars) programmed for the DoD”.<sup>92</sup>

The final step in the PPBS process is the budgeting phase. This step “. . . involves refinement of detailed costs and development of the individual service Budget Estimate Submission (BES) needed to accomplish the approved program. Following review and

approval, the budget then serves as an input to the President's Budget on which legislative action is taken".<sup>93</sup>

The PPBS is an OSD-driven process. Title 10 of the US Code gives the services the authority to recruit, train and equip forces. However, the process ultimately must be able to provide forces and equipment to the warfighting CINCs that enable them to meet their assigned missions. But it is only recently that the CINCs have been given any voice at all in the resource development process. In 1984, "... several CINCs expressed concern regarding their limited participation in the POM development. In November 1984, the Deputy Secretary of Defense directed that three actions be taken to enhance the role of the CINC in program development. First, he directed the CINCs to submit a list of their "higher priority" needs to the SECDEF and the CJCS. This list is called the Integrated Priority List (IPL). Second, he directed the services to report in their POM the funding level for each IPL. Finally, he permitted the CINCs to take exception with the service POMs by submitting issues for consideration during the Program Review. CINC participation in PPBS increased over the last several years, resulting in closer coordination at all levels, greater cooperation among the services and more senior leadership involvement throughout the process. Ultimately, these improvements are helping provide each CINC with the optimum mix of forces, equipment and support within fiscal constraints".<sup>94</sup>

Additionally, the CJCS reviews and assesses the adequacy of each service's POM to meet assigned objectives via the CPA. "The CPA provides the assessment of the CJCS of the services' POMs, in order to assist the SECDEF in decisions on the defense program. The CPA summarizes the views of the CJCS on the balance and capabilities of the

POM force and the support levels to attain US national security objectives. The Chairman recommends actions to improve overall defense capability within OSD fiscal guidance”.<sup>95</sup>

By all accounts, the orderly process described above should ultimately be able to provide program directors with the resources necessary to provide the warfighters the capabilities they require to meet their missions. Unfortunately, this is not the case. Services must find sufficient funding for operations and sustainment, on-going acquisitions and new technology or acquisition initiatives within an ever decreasing Total Obligation Authority (TOA) line. Services are caught in a precarious balancing act between sustaining operations and operational tempo, and providing for the future in terms of acquisition programs (replacements, modifications, and new capabilities).

Throughout the PPBS process, the specter of service parochialism ultimately causes the resulting DoD budget to be a “least common denominator” compromise between conflicting requirements. “The (services) obtain (their) funds annually through an interactive budget process within . . . DoD and then between the executive and legislative branches of the government. It is an exercise in advocacy: first between the JCS and the Unified and Specified Commands; next between the (services) and the JCS as a corporate body; then between the military establishment and the National Command Authority; and finally between the executive and legislative branches of the US Government”.<sup>96</sup> “This process worked well when increasing budgets could absorb the costs of disconnects and new program starts. However, recent fiscal realities have resulted in a system much harder to manage”.<sup>97</sup> Individual services fight protracted battles to retain as much budget authority as possible. Each service fights to persuade each successive decision authority

for the need to increase its respective budget, to the detriment of the other services, to accommodate priority “unfunded” initiatives.

These seemingly endless battles place continual pressure on the program directors in the field to manage changes to their funding profiles. Additionally, the Congressional appropriation for the program and the amount of funding ultimately distributed to the program director may differ significantly due to withholds, unspecified cuts, realignments or reprogramming and taxation imposed from both OSD and service levels. Also, the program director may be reliant on funding from several different sources (program elements, services, agencies) which may or may not arrive in sufficient quantities or in a timely fashion to support the acquisition effort. These changes are frequently a major cause for program instability and can have severe negative consequences such as changing scope, quantity, schedule, and unit price.

Currently, OSD centrally controls the DoD budget process. Each service individually prepares its portion of budget and forwards this information to OSD. Because the resources available cannot begin to cover the needs throughout DoD, ultimately hard choices must be made regarding which requirements will be met and which will go unfunded. The services, the JCS and the CINCs are allowed to provide their inputs into the decision-making process. However, in the final analysis, OSD makes the decision. However, the personnel of OSD are not warfighters—they do not have to live, fight and, perhaps, die as a result of any decisions they might make. Thus, from a process standpoint, centralized control of the budgetary process at the lowest possible level is essential for optimizing investment decisions on weapon system acquisitions that will provide the capabilities the warfighters’ deem are most important. Having carefully crafted plans for tech-

nology development to support forecasted warfighter mission deficiencies are of no avail without the requisite funding. Without funding, there is no program.

Centrally controlling the budgetary process, concurrent with centrally controlled and integrated requirements and technology development, allows defense planners to optimize acquisition investments. Such central control of these major processes at the lowest level can be found in defense agencies such as the Defense Airborne Reconnaissance Office (DARO) and the Ballistic Missile Defense Office (BMDO). These organizations centrally control their funding and must carefully balance requirements and technology development. A centrally controlled and integrated marriage of budgeting, requirements and technology will enable the DoD to get the most out of our austere acquisition and modernization budgets. Proper management of these three processes will also enhance the conditions necessary for program success—stable and complete mission requirements, focused and relevant technology development and properly phased and stable funding. It would yield shorter product development cycles and systems that meet warfighter needs.

Review of the budgeting process yields the following recommendations for a reengineered budgeting process:

- A. Centrally controlling the budgetary process, concurrently with centrally controlled and integrated requirements and technology development, allows defense planners to optimize acquisition investments.
- B. A centrally controlled and integrated marriage of budgeting, requirements and technology is essential to get the most out of our austere acquisition and modernization budgets.
- C. Proper management of these three processes will also enhance the conditions necessary for program success—stable and complete mission requirements, focused and relevant technology development and properly phased and stable funding. It should yield shorter product development cycles and high user satisfaction with systems that meet warfighter needs, for which doctrine and organizations are ready to employ and that are deployed to the users in a timely fashion.

## **The Management Process**

The purpose of the management process is to facilitate the development of a product in an efficient, responsible and streamlined fashion. The art of management is balancing risk to optimally control cost, schedule and performance during the development cycle and ultimately deliver production items that satisfy valid warfighter deficiencies and are operationally suitable and effective.

The top-level documents that establish policy and requirements for the management process are DoDD 5000.1 and DoD Instruction (DoDI) 5000.2. These are the program director's bible. They provide a thorough description of the management process through the developmental phases, milestone, and requisite reviews. The directives also describe legal, contractual, financial and reporting requirements. Additionally, they detail the linkage between acquisition program management and the requirements and budgeting processes.

Acquisition management is reinforced by a systematic, sequential development cycle. Each discrete phase of the development cycle has a beginning and ending point known as a milestone. Transitioning from phase to phase requires successful completion of a program review by an appointed milestone decision authority (MDA). For the largest DoD acquisition programs, the MDA is the Defense Acquisition Executive (Undersecretary of Defense for Acquisition and Technology). For smaller programs, the decision authority may rest with the procuring service or agency.

The reengineered management process must provide the program director the necessary management tools and structure to efficiently accomplish the mission. The management tools should support a generic development model applicable to most, if not all

DoD system acquisitions. We must structure this model to engender success, similar to following a proven recipe. In addition, the model must be flexible enough to adjust to potential changes from the dynamic environment. Having a generic model with attendant management tools simplifies and standardizes training and facilitates common understanding between the acquisition managers and the warfighters.

The reengineered management process should consist of a product development cycle that follows a logical development sequence. It should enable the program director to manage development risk (cost, schedule, and performance) to efficiently produce items that satisfy a stated need. A generic product development cycle follows as illustration.

- A. The first phase of the generic product development cycle begins with a definition of the need, as clearly and completely established as possible. This need may have its basis in either customer pull or technology push. Customer should specify requirements in a functional or mission fashion citing a specific needed capability, as opposed to a system specific solution.
- B. The second phase is to develop concepts, either adaptations of existing products or completely designing new products, which could potentially satisfy the need. These concepts are considered in context of the current and projected state of technology. This becomes an iterative process as the original need may drive the timing of the development cycle. Short development cycles, mandated by the need, may limit the solution to currently available technology. Early cost estimates should aid in fully scoping the investment commitment. Conducting a cost-benefit analysis should help prioritize the potential solutions based on how well they satisfy the need, the potential technology risks and costs involved.
- C. Once a concept is both cost effective and feasible, and financing is available to continue the development; the third phase begins. This encompasses the transition of the selected concept from paper to physical form. Beginning this phase with a thorough definition of system level requirements is critical to effectively managing risk.
- D. The fourth phase consists of system or product level verification testing to ensure the prototype satisfies the system level requirements. This phase also includes test marketing with the customer to ascertain product suitability and customer acceptance.
- E. If the product meets the original need and has both continued financial support and customer acceptance, the fifth phase of the development cycle begins. The desired quantities of the final design are individually manufactured or mass

produced, depending on the circumstances. Acceptance testing follows completion of each product or block of products.

- F. The sixth and final phase of the development process is distribution of the product to customers and customer support. The manufacturer provides the product to the user. The customer may require assistance with the product. Thus there may be an expected level and period of customer support. This may include warranties, service contracts, stockage of consumable items, repairs and replacement parts, technical support, etc.

The intent of this generic product development cycle is to logically track the original need or requirement through successive levels of product development. The goal is to ultimately deliver final production items that satisfy the user and meet the need at an affordable and predictable cost. If the product cannot satisfy the predetermined criteria to pass the next phase, the decision authority could curtail development or could return to a previous phase for further development. Some overlapping of phases is permissible if, by conscious decision, the risk is acceptable and manageable.

The ideal generic product development cycle just described is identical to the framework for the DoDD 5000.1 and DoDI 5000.2 management processes. Thus, it appears the DoD product development cycle or model is a logical construct for the managing defense acquisition. This does not imply that current implementation policies for the framework in these directives are effective. Nor does this imply that the basic processes supporting the product development cycle are efficient.

We recommend creating an environment of relative stability through centralized control of requirements, budgets and technology. Beyond creating this stability, the reengineered acquisition system must give the program directors the wherewithal to do their job. Once assigned, the program director must have the responsibility, authority, resources and staff to conduct the acquisition. This does not imply we should eliminate

oversight once a program begins. On the contrary, milestone decision authority oversight is necessary to redirect programs as necessary to account for contextual elements beyond the program director's purview. Dramatic events on the world scene may alter program requirements. Force structure changes may dictate reduced scope or quantities for the weapon system. New technologies may emerge which present opportunities, not previously available, to lower costs or enhance producibility. Oversight authorities must be apprised of program status in order to assess potential impacts from external effects and direct action that will accommodate these.

A proper balance of acquisition oversight and reporting must be established. The current plethora of monthly, quarterly and annual reporting is a case of bureaucracy run amuck. The program director and staff, particularly of major programs, spend an inordinate amount of time and resources satisfying reporting requirements, government oversight reviews and answering higher level concerns in regard to program status. All this activity detracts from the real mission at hand—managing the program and the attendant contractors. At the level of the program director, a single DoD reporting requirement may entail collating multiple lower level reports and briefings. This problem is particularly acute when approaching a major program milestone decision. It can take 18 or more months to prepare for that single decision meeting. This entails intensive preparation, review of dozens of reports and a myriad of briefings and meetings. The reengineered management process must balance the need to keep oversight apprised of program status against the effort and resources required to generate this data and reporting.

Key conclusions and recommendations with regard to the reengineered management process are as follows:

- A. The DoD product development cycle or model is a sound and logical framework for acquisition management. It provides a systematic, yet flexible mechanism for balancing program management needs.
- B. We must execute program management in a decentralized fashion. Senior management (oversight) must empower the program director and provide the authority, resources and staff to accomplish the mission. Senior management must then trust him or her to do the job in accordance with approved acquisition policy. The program director must be both the singular authority on the acquisition program and must be held accountable for all actions regarding execution of the acquisition campaign.
- C. We must minimize and balance program management reporting requirements. We provide senior management the necessary information to monitor program status while not expending excessive effort and resources required to generate this information.

## **The Operations and Support Process**

The O&S process is very broad and diverse. It varies widely depending on the type of weapon system involved, its operational functions and environment, the service or agency using it and the sustainment concept. The basic function of O&S is self evident—employ the system in support of military missions and sustain the system in a high degree of readiness.

The O&S process affects the acquisition system in a number of ways. For example, O&S forms the baseline used in mission area analysis. As mentioned previously, MAA is the principle vehicle for identifying deficiencies in the current force structure. Also, the O&S process leads to identification of potential system modifications and enhancements to improve capabilities or sustainability. This process may trigger new technology initiatives. These have a direct effect on the requirements and technology processes. O&S costs clearly comprise the majority of a weapon system's life cycle costs.<sup>98</sup> Early decisions with regard to O&S, therefore, will drive out-year costs. Conversely, budgets may constrain the funding available for O&S, thereby dictating employment and

sustainment concepts. A clear link, both to and from the budgeting process, is evident. Lastly, O&S may affect the management process both directly, through the availability and flow of government furnished material, and indirectly, through the establishment of O&S requirements, technologies and budgets.

O&S does play an important role in affecting the processes within the acquisition system. It may generate new requirements, limit available budget or push some technology development. All of which affect management. However, it is not likely the cause of a “broken” acquisition system. As such, we did not consider the O&S process further in the reengineering effort. However, O&S is a fundamental macro process. Any changes to the acquisition system must be integrated with the O&S process at the earliest stages of program development.

### **General Conclusions for a Reengineered Acquisition System**

Many people believe the DoD acquisition system is broken and cast aspersions on the management process controlling documents—DoDD 5000.1 and DoDI 5000.2. We contend that the framework of the management process—the sequential product development cycle—is sound. Rather, the integration of the five macro processes is inadequate, making the system incapable of consistently performing within acceptable parameters, i.e., cost, schedule and performance. This lack of process integration, coupled with negative influences and instabilities brought on by decentralized control of requirements, technology and budgeting have the synergistic effect of breaking the acquisition system. External influences of contextual elements exacerbate this situation (Congress, changes in administration, world geopolitical dynamics) and further jeopardize the potential for suc-

cessful acquisition programs. It is this massing of deleterious influences and instabilities that cause a two decade development cycle for the C-17 transport aircraft, or drive the cost of a B-2 bomber to exceed \$1 billion per copy. It is not solely the fault of any one of the processes. Rather, it is the collective failure of all the fundamental macro processes as they converge and diverge in a decentralized, disjointed fashion.

It would seem on analysis, that DoD's implementation of the acquisition system does not consistently take advantage of lessons learned on prudently employing military forces in a campaign or operation. Warfighting doctrine emphasizes centralized control and decentralized execution. We seem to operate the acquisition system in direct opposition by implementing decentralized control and centralized execution of key macro processes. We manage the requirements and technology processes in a decentralized fashion, while exerting tight and central controlling on program management and budget (particularly for large programs).

The reengineered process must address many of the conclusions and recommendations made for the five macro processes. These processes are within the control of DoD. Other external influences, beyond DoD control, must be continually monitored as potentially destabilizing factors. Unfortunately, most are impossible to predict and therefore difficult to mitigate. Flexibility will always be the key to DoD accommodation of these external factors.

We have set the stage in previous chapters for the need to change the acquisition system. This need is not driven solely by DoD's declining resources, although this is a compelling reason. Even with an abundance of resources, the current acquisition system and its attendant processes are incapable of consistently producing effective weapon sys-

tems with business efficiency. Today's development cycles are lengthy. Costs are exorbitant. Extensions and overruns are the rule rather than the exception. The macro processes of today's acquisition system are simply not effective as implemented.

We have focused on the essential acquisition processes and developed some critical conclusions. The reengineering of the acquisition system must first engender an environment of relative stability through the centralized control and coherent integration of the requirements, technology and budgeting processes. It then dictates decentralized execution and accountability for programs through an empowered single manager who, given the resources and staff, is entrusted to execute the mission in accordance with approved acquisition policy.

## **Chapter 5—The Reengineered Acquisition System**

The solution to the many problems identified thus far involves more than acquisition system “edge-trimming.” We need a wholesale change in the system’s processes through reengineering, with some complementary change to organizational structure to have the DoD’s acquisition system meet the needs of the 21st century US military. Whatever the eventual outcome, the underpinning of the new approach should be in centralized control, decentralized execution and process integration. To do this, the acquisition system needs to parallel, as closely as possible, the joint warfighting planning and execution process.

Missions to carry out the National Military Strategy (NMS) are now identified and assigned to the CINCs at the joint services level through the Unified Command Plan (UCP) based on joint level threat analysis. CINCs then develop their operations plan (OPLAN) and concept plans (CONPLAN) and are apportioned and/or assigned resources based on their approved plans. Due to scarce military resources, the CINC is then allocated additional resources in times of crisis to fulfill his mission. To execute the plans, the CINC or JFC is given relative freedom to conduct the military campaigns with the given joint forces.

Paralleling this, we believe the acquisition system should jointly identify requirements, be allocated funding and be delegated execution from the joint level based on identified joint missions and capability shortfalls. Such a solution effectively integrates and centralizes control over requirements, budget and technology. In parallel, we must de-

centralize acquisition execution with minimal oversight. Key to success in both cases is responsibility and accountability delegated to a single commander charged with campaign execution.

### **Process Changes**

Our solution will retain the five fundamental macro processes of requirements, technology, budgeting, management and O&S, but will propose dramatic changes to them. Initially, all requirements will flow to the joint service level for early determination of joint applicability. We will also provide a better means for DoD to link mission requirements to advances in technology. This will bring into concert for the first time, the CINC's requirements "pull" and the service laboratories and industry's technology "push." Next, we will radically alter the DoD budget process to shift the centralized accountability and control to the lowest level. Budgeting for acquisition will be at the joint, not service, level for meeting requirements, to ensure the CINCs' highest priority programs are funded. Lastly, the manner in which we execute management of acquisition campaign will mirror, to the maximum extent possible, the way that DoD military forces plan and execute the National Military Strategy.

### **The New Requirements Process**

The first changes will need to occur in the requirements process. CINCs and service chiefs will still be able to submit new requirements, but all requirements will flow to the joint service level for validation and integrated resource prioritization. These requirements will need to be much more capability oriented than threat oriented.

Future threats will be very unstable and unpredictable in many cases. Only through capabilities based acquisition can future forces have the flexibility to meet the changing world situation. Throughout the remainder of this paper, the reader should interpret the term "requirements" to mean a new or expanded capability for the US military forces.

CINCs and the service chiefs will no longer be allowed to present predetermined solutions to stated requirements. Such requirements will be returned to their submitter. The joint service level will consider all requirements for joint application and solution. There will be some requirements that will only have single service applicability. But as future military operations becoming increasingly more joint in nature, acquisition programs, in turn, will become increasingly more joint.

Requirements inputs from the CINCs and service chiefs will allow for customer “pull,” but it will also be very important that technology “push” be a part of the process. We believe there should be a group of people monitoring technology who can submit technology “push” requirements into the joint services arena. We will discuss this concept further in the “New Technology Process” section.

Prior to validation, simulations and wargaming should provide concrete evidence that the requirement shortfall will have an adverse impact or that a new technology will have a positive impact on the CINCs’ mission accomplishment. A joint version of the MAA now conducted at service levels will provide input for the validation process. It will also provide a basis for considering changes to joint doctrine and organization structures to effectively integrate new requirements into planning as soon as solutions to requirements are identified in the management process. It will be important to ensure that the

joint MAA of the future reflects not just our wartime missions, but the variety of MOOTW missions that CINCs will continue to be required to perform.

These requirements need to flow to the joint services level for several reasons. The first is to avoid costly duplications between the services, unless a conscious decision is made that we require or desire redundancy. It will allow for early decisions regarding what requirements have joint applicability so that, during the execution of the solution, the proper players are involved up front. Differing service priorities for programs, which impact funding, will no longer be an issue on joint programs. There will no longer be the experience of the Tri-Service Standoff Attack Missile (TSSAM). The Army's withdrawal from the program would have left the Navy and Air Force with considerably higher program cost shares had the entire program not been canceled outright. Under our new joint process, tri-service support and budget for the entire effort would have been guaranteed from the beginning. Alternatively, program termination would have occurred much sooner, thus releasing funds for an otherwise unfunded requirement.

With centralized prioritization, the CINCs will have much more input on what programs have the highest priorities. This in turn should link acquisition more closely to the joint mission requirements identified in the UCP. Just as new requirements will be integrated into the priority list, systems under development that have become obsolete or need changing prior to fielding, will also need to be identified quickly. This will ensure optimization of scarce acquisition resources. Timeliness will be a major challenge of our process change. In a bureaucracy as large as the US military, this will not be easy. But with the changing world situation, it will be absolutely essential. By validating and prioritizing requirements at the joint service level, we will positively impact the joint planning

process. New requirements surfaced early in the acquisition system can result in parallel changes in doctrine and organization to most fully utilize whatever capability is eventually provided.

### **The New Technology Process**

We propose that much more emphasis be given to technology insertion at the joint level. This will not be successful without strong integration of the technology process with all the other macro processes in the acquisition system. Just as the requirements process will have its basis in the form of a joint MAA, so too must the technology be jointly focused. Through the integration of future technology and warfighters' visions of future missions, will come visions of a battlefield where new technology and doctrine combine together to greatly expand our combat capability. A perfect example where technology "push" and customer "pull" complement each other is the Army Force XXI concept that includes digitization of the battlefield. This concept, at first look, is for the Army battlefield of the future. However, the implications to the synergy of the joint land, air and sea battle, based on current and emerging technology, open many interesting prospects to changing the way the US military fights battles.<sup>99</sup>

Through the use of simulations for joint wargaming and new weapon systems, warfighters will develop needs for new capabilities. They will submit requests to fulfill these capability needs into the joint requirements processes. If necessary, supporting doctrine and organizations will be developed. The new technology will already be "sold" to the warfighter. He will see just how effective the technology could be on the simulated battlefield and will plan for its actual use on the real battlefield of the future. The war-

fighter will be an integral part of the technology insertion process instead of being the last to know about new technology capabilities. This will also force the technology advocates to have a good understanding of the warfighters' world, for without warfighter approval, their technology concept will die. Joint control of the technology process will allow us to optimize scarce budget dollars by pursuing technology which the warfighters believe can have the most benefit on the battlefield of the future

In summary, we believe that a technology process closely integrated with the joint requirements process will most effectively meet the warfighters' needs. Controlling technology insertion at the joint level, when integrated with developing concepts for the battlefield of the future, will make possible revolutionary advances in combat capability. It will further ensure allocation of constrained resources to only those most promising programs. Joint doctrine and organizations will change concurrently with the technology, to maximize eventual effectiveness of the new technology on the battlefield of the future.

### **The New Budgeting Process**

Commensurate with centralized joint requirements prioritization, the logical change to the budget process will be to budget and fund all acquisition programs at the joint level. Funding will then flow directly to the acquisition program, whether it is a joint or single service program. Once validated and prioritized through the requirements process, any program with priority high enough to remain above the funding cut line will receive funding stability throughout program execution.

If a program underwent prioritization and funding once, this would be an easy process. However, as requirements are added or funding is cut, the program must change.

Again, the prioritization in the validation process will determine which program(s) will lose funding to meet a more important, unfunded program requirement. For joint programs, the individual services will no longer have to compete individually at the OSD or congressional level for money on their part of the program. Congress will either fund the entire program or not.

There are many benefits to a consolidated joint acquisition budget. In the requirements process, prioritization comes about because budget resources are always constrained. There is never enough funding for everything the military believes it needs. Therefore, in times of very constrained acquisition budgets, it is more critical that funds be used to satisfy only the most needed joint requirements. Service parochialism cannot be an issue. It is much too costly. With the prioritization of requirements at the joint service level, resource allocation is determined very early in the process. Competition for resources would be done internally at the joint level, not externally with Congress.

With joint budgeting will come a single face to Congress as well as the public to answer acquisition questions. When Congress questions a particular part of a program, the defense representative will present a joint perspective that reflects the best interest of all the services. The military services will settle all competitions for funding of programs at the joint level prior to budget submission to the OSD. Various services might be called to testify and answer Congressional questions, but the responses from the services should portray a more unified position on why particular programs have their assigned priority. There must be a clear understanding between the services of what the CINCs need to accomplish their mission. There must also be very careful consideration of exactly how the research, development and acquisition funding requested in the budget will best support

the CINCs' missions both short term and long term. The focus is not on service capabilities, but the CINCs assigned missions. This must be the basis for all budget decisions.

Joint control of requirements and budget should help preclude costly "mission creep" from occurring in programs. We can build budgets from current technology solutions and well-defined requirements. If the requirements need modifying, funding for the changes should be available. If that funding comes at the expense of another program, so be it. The program just above the budgeting cut line in the priority list, should absorb the hit. Should the requirement for a program be rescinded, regardless of program phase in the life cycle, there would be a need to go back to Congress to identify that program and request funds be reprogrammed for the next unfunded program on the priority list.

Through this change in the requirements and budget process, we hope that the relationship between Congress and the military will improve. Congress now directs joint programs because the military has not actively pursued joint programs. We tend to fight joint programs because they are more difficult to execute than a single service program. The focus of acquisition should be on how to improve the acquisition system to make joint programs easier to execute—not on fighting the process because joint programs are more complex. A positive, long term result may be that Congress will be less likely to micro-manage the programs. We cannot control Congress, but we certainly can improve our relationship by doing a better job at acquisition.

Through the new centralized prioritization and budgeting processes, programs should have less fluctuation in their annual budgets—a major cause of slips in program schedules. Programs high on the list of priorities will have relative assurance of full funding year after year. Program directors will be able to confidently budget, schedule and is-

sue contracts with assurance that the funding stream remains intact. The goal on small programs will be to have the time elapsed, from funding to production, be much less than the FYDP cycle. There are many program directors and project managers today who believe steady funding would enhance execution of a timely and cost controlled program. Additionally, there are many warfighters who would like to see acquisition programs fielded much faster to give them an advantage on the battlefield. Again, we cannot control Congress, but if we better control the internal management of military programs, Congress would probably be less likely to want to control the programs. Through these changes in the requirements, technology and budgeting process, we believe that the execution of the individual acquisition programs will become much easier.

### **The New Management Process (Waging the Acquisition Campaign)**

Now that we have defined and prioritized the requirement and it is above the cut line for budgeting, we will now change the program execution process, but only at the macro level. We propose that the management process be more decentralized and offer less oversight than today. For requirements that are obviously single service, program acquisition will be assigned at the single service level. But for requirements that have joint applicability, the person in charge of finding and executing a solution for the requirement will be assigned at the joint level.

This is again analogous to the JFC who is assigned a mission and then allocated joint assets and empowered to execute his campaign. So too, the acquisition campaign must be assigned to one person who will be allocated the necessary acquisition assets and empowered to find a solution for the requirement and then delegated the authority to field

the solution. The equivalent to the OPLAN in this case would be the acquisition strategy. A part of that strategy must be finding a solution that is optimum for all the services, not just one service. Just as the JFC must optimize his joint resources, the acquisition force commander must look across all the services and decide what solution can have the optimum result in meeting the CINCs' missions. The acquisition commander must have no service parochialism and be purely "purple." Should the requirement not be technologically feasible within the designated timeframe, he would feed that information back to the requirements validation process for consideration of alternative actions. The requirements validating body could then decide whether the requirement justifies pushing technology to find a solution with appropriate funding, or finding some other less desirable technical or nontechnical solution to the requirements shortfall.

At a minimum, this acquisition force commander will take the program from the requirements validation point through concept exploration and initial production. The acquisition campaign, as we view it, basically ends after fielding the new system. As the Joint Task Force (JTF) is organized for a particular, temporary campaign or mission, the acquisition task force should be organized to develop and execute a solution to the validated capability shortfall. After satisfying the shortfall or deleting the requirement, the acquisition task force would disband. For the period of the acquisition, the acquisition force commander would have OPCON of all the people, just as the JFC has OPCON of his forces.

Our new management process would ensure that the requirement given to the acquisition commander will not change without a parallel change in his budget. It is important that a change to an existing requirement flow back through the joint level for valida-

tion and a decision on whether a reprogramming should take place to support this change. It will not be the acquisition commander's job to justify additional money, it will automatically be justified by the changing in the requirements priorities at the joint services level. This will lift a tremendous burden from the acquisition commander.

Another changing aspect involves the need for oversight of all joint programs to be at a joint level. The SECDEF must be sure that all acquisition programs are being properly executed. This oversight function should rest primarily within the Joint Staff. We recognize that this will require a change in current law as our recommendations call for a wholesale redistribution of workload between OSD and the joint staff. We understand that the civilian community (i.e., OSD) must continue to maintain general oversight of programs but not to the detail we are seeing today.

As a result of these changes, the stability of a program's budget will increase. High priority joint programs will have relatively stable funding as long as Congress concurs in the importance of the program. Congress will have less difficulty allocating resources since the competition between service programs will no longer be brought to their level. With stable funding will come fewer cost overruns since fewer programs will be stretched out as one program is "robbed" to pay for another. We will then be able to award contracts with relative certainty that the money will not disappear prior to completion of the contract.

In turn, the defense industry can greatly benefit from the entire change in processes that we are proposing. Stable budgets will bring less risk. Industries will be able to bid more confidently on proposals to ensure they can make a profit. Less risk will bring more

competition which in turn will help drive down the cost of programs. This will make Congress happy, which makes management of programs easier.

By establishing more joint programs, the acquisition community should become more proficient at performing the complexities of joint acquisition. The combat forces of the various services will continue to improve on their capability to execute complex joint operations as they train and operate together more and more. Likewise the acquisition community, in executing more joint acquisition campaigns, will improve in meeting the needs of the joint warfighters. Continuous process improvement applies in both cases.

We see no major changes for the O&S process of the system except that O&S issues should be considered early in the acquisition campaign.

This concludes the discussion of how we propose to change the acquisition system. We discussed some major changes to the requirements, budgeting, and technology processes and recommended better joint integration. We believe these improvements will tremendously improve the means by which the DoD acquisition community meets the needs of the US military.

### **A Possible Organizational Structure**

The next logical question is how would this process fit into the current acquisition system, or how would such changes modify the current system? Since our focus is on reengineering, we feel that the processes are much more important than the organizational structure that would support them. We feel that the acquisition organization will have to be adaptive and develop the optimal organization for system implementation. Additionally, the system will probably require change as our world changes. Consequently, the or-

ganization must be one that is open to continually reviewing the system, improving it and in turn modifying itself to continue to adequately support the CINCs. We do offer one possible organizational solution and explain how it might work. By no means, though, are we sure this is the optimum solution. Only by trial and error will the acquisition community find the best organization.

Rather than turning the whole military organization upside down, we propose to work within the current JCS organization to accomplish the joint portion of the new DoD acquisition system. As mentioned previously, we are well aware that our recommendations for improvement will require changes to current law. We not only believe such legislation is warranted, but that Congress will strongly support it. Recall that the Rockefeller Commission in the 1950's recommended that the JCS be the "... keystone of the procurement process."<sup>100</sup>

The key to effective implementation of the new system is several organizational changes within the Joint Staff. The first involves forming a number of Joint Mission Area Acquisition Commanders (JMAAC) within the current J-8. Their function will be the continuous joint integration of requirements and technology. Our second change entails dual-hatting the JROC. We plan to add to its traditional role as a requirements review body the review of program execution, thus making it a Joint Acquisition Executive (JAE). Today's JROC will then become a Joint Requirements and Acquisition Council (JRAC). Our next change calls for the beefing up of the current J-8 organization to accommodate its greater role in supporting the JRAC. This organization will perform the additional roles of technology insertion and joint budgeting, through the JMAACs, for all new programs. Lastly, and perhaps most importantly, we would establish a J-9, Director-

ate of Acquisition, on the Joint Staff to serve as a reviewer of joint acquisition programs. The J-9 will assume the roles of current service acquisition executives (SAE). The new J-8 will receive and consolidate requirements. The JRAC will validate these requirements. The J-9 will then assign and monitor programs for JRAC execution. The J-9 will appoint the equivalent of the military JFC or “Joint Acquisition Forces Commander” (JAFC) to conduct the acquisition campaign for joint programs.

It is very important in all aspects of our recommended changes that the CINCs be closely involved in prioritizing what is needed in support of their mission success—whether the requirements be single service or joint. The CINC is the ultimate customer of the acquisition process. The CINC interface at the JCS level makes it the optimum organization for integrating the reengineered processes with minimal impact.

One existing process, the Joint Strategy Review (JSR) could be much more effective in providing focus for the acquisition process. This process currently produces the Long Range Vision Paper which looks at outyear threats. A joint Master Technology Plan, mirroring that produced by the Army and Air Force, via their TMP process, could be either integrated into the JSR document or produced as a separate publication. A resource document married to the long range concept documents should be developed. We suggest calling this document the Joint Strategic Investment Plan (JSIP). Further details of this plan are in the following chapter.

## **The New J-8**

The J-8 will have a much expanded role. It will receive all requirements from the CINCs and service chiefs along with technology insertion input from the JMAACs. The

new J-8 will ensure that requirements contain no preconceived solutions, calling instead for needed military capabilities. The office will then prepare requirements for validation, joint determination and prioritization by the JRAC. They will also prepare consolidated acquisition budgets for the entire military for inclusion in the President's Budget.

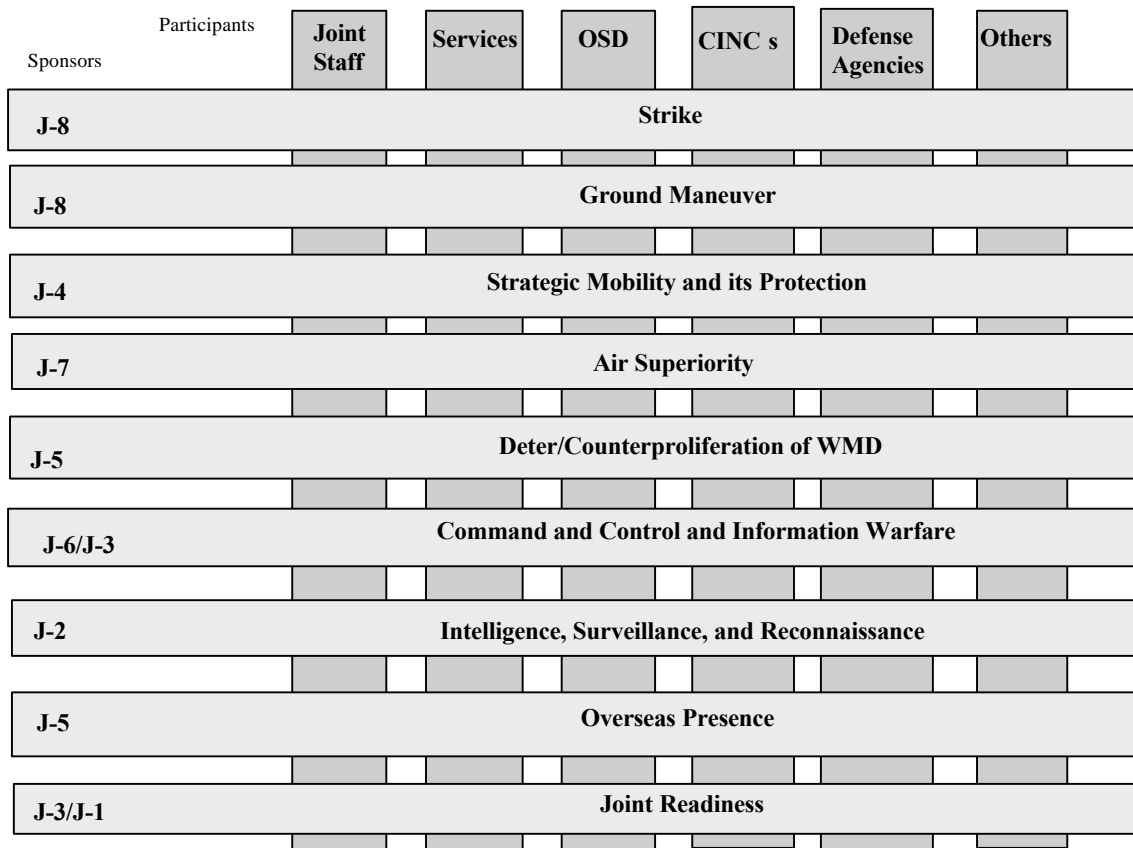
This organization would also oversee the JMAACs. Its role will expand to accommodate a greater emphasis on driving or exploiting technology, perhaps to include joint directorship of DoD labs. The role of the J-8 will grow commensurate with the acceptance within DoD of the acquisition community as an effective partner in planning and executing future joint campaigns.

### **Joint Mission Area Acquisition Commander (JMAAC)**

We want to establish a set of JMAACs, within the J-8 staff, organized by functional mission areas. They will review requirements and introduce technology to satisfy joint capabilities that meet mission requirements. We propose to appoint a JMAAC for each DoD mission area, as described by Admiral Owens and shown in figure 2.<sup>101</sup>

JMAACs will be permanent teams within the J-8 organization.

## Joint Warfighting Capability Assessments



**Figure 2: Joint Staff Mission Areas**

These permanent groups will serve as continuous integrators of requirements with technology where previously no such integration regularly took place. They will marry the CINC's mission requirements "pull" with the "push" of technology. They will work to foster emerging technologies in both industry and the DoD laboratories that have broad military uses. JMAACs will also work with the warfighters to refine mission shortfalls and clearly define requirements. Part of their role will be much like a marketing organization to aid the CINCs in seeing what technological change can assist in performance of their assigned missions. They will be one of three primary offices providing requirements inputs to the JRAC. The people in the office will have to be able to "think outside the box" to

effectively adapt current and evolving technology—or possibly consider developing new technology—that could change military operations as we know them today. Such early implementation of these critical processes can only result in leading edge technology insertion and realistic requirements definition at acceptable risk to the program.

### **Joint Requirements and Acquisition Council (JRAC)**

The JRAC will be an expanded version of the current JROC. It will serve several purposes. Beyond its current role as ultimate adjudicator on requirements, the JRAC will also decide what constitutes a joint requirement, prioritize the requirements for the budget and direct the establishment of joint programs. In addition, it will take on the role of a Joint Acquisition Executive. In its new capacity, the JRAC will serve the purpose of many of the current SAEs by reviewing program performance over the course of execution.

We believe that, with the close interface between the CINCs and the JCS, the CINCs will have major input into the working of the JRAC. Under the current system, only programs perceived by one service as having joint application, or those directed by Congress to be joint, receive attention from the JROC. With most acquisition conducted by individual services today, it is very difficult for the CINCs to provide input on major programs. Since the CINCs are truly the ultimate customer, they must have greater input to the acquisition system and its funding. Our new approach permits this direct involvement.

Of particular importance is the prioritization of the various programs for budget purposes. The JRAC will assist in presenting to Congress a single prioritized list of all DoD acquisition programs. All service arguments over relative importance will stop once

the JRAC determines the final priority list. When Congress decides to make changes in program funding, it will then be the job of the JRAC to decide what impact these changes will have on all acquisition priorities. If the basis of the prioritized list is truly the needs of the CINCs, only those programs near the budget cut line would be in jeopardy of losing funding.

As a group we had serious reservations about the same body having authority to validate requirements while also having oversight of program execution. One concern is the potential that the JRAC, after validating and starting a new program, then determining the program could not fully meet the requirement, could simply adjust the requirement to the level achieved by the acquisition program. This would send a signal that a program no longer truly fills the requirement a CINC submitted. On the other hand, there is a concern that a program could be canceled for not meeting a specific requirement within budget, when a less stringent but fully fundable requirement would actually meet the CINC's intent. In this case a CINC may need a weapon that achieves 90 - 95 percent accuracy, but the current acquisition program achieved 89 percent accuracy. It will take \$500 million to get the next 1 percent. In this case, the JRAC must be able to balance requirements and funding and be willing to accept the 89 percent accuracy instead of taking money from another CINC program to effect the marginal gain in accuracy. This will make the process responsive to the mission needs of the CINC and build flexibility into an otherwise rigid system. We considered recommending a separate organization at the joint level to ensure oversight responsibility, but decided instead that a single JRAC organization, with its joint expertise was the best solution to balance the dual responsibilities of requirements validation and program oversight.

## **The J-9**

To help separate requirements validation from oversight within the JCS, we propose to form a J-9—Directorate of Acquisition. This directorate will provide a joint approach to DoD acquisition management across the services. It will play an integral role in matching current and projected resources to existing war plan requirements. It will further, via its interface with the J-8 and J-7 staffs, lend realism and accuracy to forecasting future DoD warfighting resources. It will signal to the services the importance of inter-service efficiency in spending what amounts to nearly one third of the FY95 DoD budget.<sup>102</sup> Further, it will force an end to service bickering about joint weapon system program budgets and management.

The J-9 will appoint the JAFC once a program has a validated requirement and has been funded. The J-9 will then perform the day-to-day oversight of the programs for the JRAC and forward program data to OSD as required by law. This ensures ultimate OSD and civilian control over program execution.

## **Joint Acquisition Force Commander (JAFC)**

The JAFC leads the joint acquisition campaign. This person's focus must maintain a joint perspective from the start. Service parochialism on the part of the JAFC would not be tolerated and would seriously detract from the overall benefits of this approach. Just as the JFC can draw personnel and resources from all services to conduct a mission, the JAFC must be able to draw necessary support from the services to meet the stated acquisition requirement. Actual conduct of the campaign will depend on any future changes to DoD 5000 series directives. Therefore, the details of this execution are beyond the scope

of this paper. The JAFC will remain answerable to the J-9 and ultimately USD(A) for chain-of-command purposes. We hope, though, that the JAFC will be permitted to function with minimal oversight and to make optimal use of the resources available, whether people, funding, or materiel.

### **An Example**

So let's look at an example of how this process and organization might work. A CINC finds a new nonlethal chemical threat in the arms market that causes every person within a twenty mile radius of dispersal to fall asleep for 3 hours. The enemy packaged the chemical in a canister the size of a soup can for remote dispersal. Current chemical gear is unable to protect against this new chemical.

Under the current acquisition system the Army would start their requirements process to come up with some new individual and crew protective systems to counter the chemical. The Marines might monitor the Army program and to eventually buy into the program. The Air Force is not too worried about the threat because it assumes the only place it might hurt them, is at their basing sites. The Navy has fewer worries since they believe they can better control access to their floating bases.

With our reengineered process, the JRAC believes that this threat has the potential of affecting any service. The enemy can plant the canister inside any type of vehicle, ship or building. It has further been determined that the chemical spreads vertically in the atmosphere, affecting aircraft at altitudes to 50,000 feet. Through the combined efforts of the JMAAC monitoring new technology and the JAFC looking at the joint applicability, they find an antidote chemical. They also discover that they can detect the chemical

through space assets immediately upon dispersal. Therefore the JAFC directs development of antidote canisters for mounting in vehicles, ships and buildings, others that unmounted ground troops can carry and a third version for dispersal by aircraft through standard chaff and flare dispensers. When a satellite detects the chemical threat it is able to send a signal to release the antidote within a 20 mile radius of the dispersal point.

A little far-fetched? Maybe. The point is to determine early those threats that have joint applications and optimize the services capabilities to counter that threat without duplicating efforts.

## **Chapter 6—Industry Parallels**

### **Industry Survey**

This research focuses on the fundamental macro processes of the DoD acquisition system. Borrowing the tenet of centralized control with decentralized execution from military doctrine, we made recommendations to reengineer the acquisition system. The major thrust of the recommendations is to assign authority and responsibility for integrating acquisition related requirements, technology development and budgeting under the centralized control of the JCS. The effect is a DoD strategic investment plan that optimizes expenditures and commitments in new systems and technologies. Decentralized program execution means delegating to a single accountable individual the responsibility, authority, resources and staff to wage the acquisition campaign. This individual would be held accountable through the oversight of the JCS. This approach directly parallels that taken by many successful corporations across the US industrial base.

We have long recognized centralized control and decentralized execution as effective methods for planning and executing successful military operations. However, in many cases the acquisition system more closely resembles business operations than a military campaign. To support and validate our recommendations, we sought to examine standard industrial management practices employed by across US industry and compare them with our findings. We distributed a survey to a variety of defense and commercial corporations

and industrial specialists to assess successful business operations processes. Refer to Annex A for a sample of the correspondence and a list of respondents.

Specifically, we sought to validate two principle conclusions we reached during our review of defense acquisition system. The first conclusion deals with the actual practice of centralized control and decentralized execution. The essence of this is to understand the degree of control exercised by corporate headquarters over the operations of their divisions. How do successful corporations accomplish strategic planning? Do corporate headquarters integrate and balance business opportunities (requirements), technology development and resources across divisions? If so, who formulates the policy and makes these decisions—the President and Board of Directors (BoD) or a corporate entity that integrates and optimizes division operations and presents this plan to the BoD for sanction? Once decisions are made, do division managers have the responsibility and authority to carry out the strategic plan and operate the division within the boundaries of policy? That is, do corporations permit decentralized execution of division operations or do they impose restrictive oversight and decision authority?

The second conclusion concerns the character of the product development cycle corporations use to bring products to the market. What are the steps in a typical corporate product development cycle? Do corporations use a sequential process similar to that employed by DoD or is concurrency permitted and routinely employed? What drives the corporate product development cycle—risk, cost, market timing? Most importantly, is the logic behind the sequential flow of product development process used by the DoD sound?

The results of the survey highlight important parallels between corporate business practices and our reengineered solution. As such, the industry survey provides validation

and support for our recommendations for centralized control and decentralized execution. The results substantiate that the logic of DoD's product development cycle is sound. However, strict sequential application of the process is insufficient. This finding also supported our conclusions.

### **Centralized Control and Decentralized Execution**

A clear parallel was evident between the DoD approach to centralized control and decentralized execution and that of industry, but at different levels. Key to drawing the parallel, is an understanding of the contextual elements surrounding both organizations. In industry, each division typically has its own set of product lines, available services, customers and a distinct mission. In industry, there is little need or motivation for integrated planning at the corporate level. In the DoD, current warfighting doctrine emphasizes the importance of synergy achieved through joint operations. DoD product development and service to the nation demands tri-service cooperation and synergy of operations. The common mission, to succeed in battle, calls for a common approach to weapon system product development just as it demands joint warfighting.

We argue for centralized control within the JCS and for a less participatory role for OSD and the SECDEF. In our model, the SECDEF and OSD would provide overarching guidance and policy (as does a BoD for corporate America) and act as the sanctioning authority over JCS strategic planning. We would call for a DoD strategic plan to be developed to integrate and balance business opportunities (requirements), technology development and budgeting. Such a Joint Strategic Investment Plan, would optimize investments and commitments to defense acquisition programs and critical technologies

across the FYDP planning period. The JSIP would integrate and prioritize acquisition and technology programs across the services and agencies.

Industry's divisions operate under the guidance of a strategic plan. The strategic plan is developed from the bottom-up with inputs from the division staff. Division leadership provides guidance during plan development based on broad corporate policies and objectives. When complete, the strategic plan represents a long-term (typically 5 years or more, never more than 10), prioritized operations roadmap for the division. It integrates on-going business and forecasts of potential business opportunities, technology initiatives, and budget requirements. The plan includes provisions to take advantage of unforecasted opportunities. The division leadership approves the completed strategic plan and submits it to corporate headquarters.

The role of the corporate staff in this process varied significantly among the corporations. In some cases, corporate presidents and the BoDs were directly involved in reviewing and approving the division strategic plans. In other instances, the corporate plan was forwarded to headquarters solely for information. Mr. Krikorian, a noted industrial base expert for the DoD, characterizes the role of the president and the BoD in strategic planning as follows: The president normally has the responsibility and authority to approve the divisions' strategic plans. However, the president may seek or require BoD involvement if the strategic plan involves borrowing resources, construction of new facilities, mergers and acquisitions, restructuring or major new product lines.<sup>103</sup>

At the corporate industry level, there appeared to be no systematic integration and prioritization of business opportunities, technology development and allocation of resources across the divisions. This, however, does happen at the division level. Each divi-

sion strategic plan is treated singularly. One exception may be found in that some companies do centrally control technology development. Although most corporations have discontinued stand-alone research and design centers, they maintain a corporate manager responsible for technology development.<sup>104</sup> This manager monitors and focuses R&D efforts and facilitates cross-flow of technology among the divisions.

The industry survey strongly validated our recommendation with regard to decentralized execution. We found that corporate headquarters generally permit nearly autonomous operations by their divisions. Divisions are given the responsibility, authority, resources and staff to conduct operations in accordance with the approved strategic plan. The division executive vice president is held accountable for the goals established in the division plan. Similarly, the vice president entrusts other division managers to monitor and accomplish their portions of the plan. This is not to imply there is no corporate oversight. Corporate headquarters monitors progress towards achievement of sales goals. When compared to the DoD, the level of oversight is minimalized. It facilitates monitoring operations, as opposed to imposing restrictions on management division operations. This is analogous to the relationship we recommend between OSD, JCS and the JAFCS. The JCS is given the responsibility and authority to execute the strategic plan (JSIP) through the oversight of OSD. Similarly, JAFCS are entrusted to execute acquisition campaigns with oversight by JCS.

### **Product Development Cycles—Sequential vs. Parallel**

The industry survey also sought to determine the character of the corporate product development cycle (PDC) and contrast it with the DoD PDC. The findings support

our basic conclusion that the logic of the DoD PDC is sound. However, industry responses do not support a strict sequential application of the PDC.

The sequence of events for corporate PDCs is similar to those used by the DoD. The order of events in the PDC is not affected by the nature of the requirement. That is, the PDC follows the same general sequence of events for those programs driven to customer “pull” as those driven by technology “push”. However, “pull” or “push” may dictate the degree of development concurrency. Mr. Krikorian characterizes the PDC as situational. It is driven by a variety of factors such as “pull” or “push”, development risk, market timing and return on investment.<sup>105</sup> For products that are essentially pre-sold, the PDC might exhibit a more low risk, sequential nature. This might be the case when companies develop products in response to customer “pull”, or when they sell products on advance orders, for example, the Boeing 777. Where products are the result of technology “push”, corporations are likely to assume greater risk to quickly capture market share. In these instances, the PDC may be highly concurrent and carefully crafted strategies will be employed to manage risk.

As an example of a highly concurrent PDC, Mr. Kelbie and Mr. Punchard of Raytheon Corporation related the development strategy for the Iridium program.<sup>106</sup> Iridium is a commercial venture. Raytheon teamed with Motorola to develop and deploy a large constellation of communications satellites, ground stations, and personal instruments to provide worldwide cellular communications. Current projections show this major program will transition from concept development to full operational capability in approximately six and a half years. If executed in a sequential DoD fashion, the cycle would likely

exceed 10 years. Clearly, the motive for this aggressive PDC is profitability and market share.

Raytheon is assuming moderate development risks to meet this schedule. One example of the corporations' plan to manage concurrency related risk is the early ordering of production materials. The company places these orders prior to final testing of a prototype. According to Mr. Kelbie, final prototype testing may result in design changes. Some materials procured prior to these changes may have to be discarded. However, this approach is cheaper and more efficient than stretching out the development. It is more costly to hold the entire development team together for an extended period than to throw away some material.<sup>107</sup>

Industry responses are strongly against the rigidly fixed sequential nature of the DoD PDC. While the steps are in the proper order, the sequential application and the requirement to recompute at each milestone are conducive to a number of negative consequences. For example, the extended development from sequential application leads to obsolescence at deployment. Recompetition at each milestone also extends the development timeline and leads to design instability as prime and associate contractors are switched during the development process. When corporations form cooperative teams to pursue commercial ventures, such as Iridium, they remain intact throughout the development process, ensuring design stability and creating an environment where risks are manageable.<sup>108</sup>

Considering industry responses, we validate our conclusion that the logic of the DoD PDC is sound. However, implementation in a strict sequential fashion is not always

a recipe for success. This validates our conclusion that the implementation of the process, and not the basic framework, is faulty.

This research did not address reengineering the PDC for concurrent implementation. Rather, we believe the added stability brought about by integrated centralized control and decentralized execution will reduce development timelines. Clearly, we can achieve greater reductions in development timelines with concurrency. We recommend additional research to reengineer the specific implementation of the PDC to encourage concurrency. Strategies will have to be adopted to manage risk, and cultures adapted to recognize that some waste or added up-front costs are more favorable than extended developments. With the ever increasing pace of world events characterized by expanding and changing threats, we must consider all avenues to increase the responsiveness of the acquisition system. Concurrency, a negative term in light of the B-1B experience, may become a routine practice in tomorrow's acquisition system.

Mr. Krikorian provided one final observation in the industry survey.<sup>109</sup> He highlighted an additional negative consequence resulting from the bureaucracy and over regulation of the current DoD acquisition system. He cites that program directors are not encouraged or rewarded for assuming risk or for deviating from approved acquisition policy for the sake of common sense. On occasion, program directors have done the right thing, even if this slightly deviated from strict compliance with directives. Unfortunately, risk taking and creative management are normally stifled by those that blindly follow the directives and policies. Examples of some of the negative consequences are requiring excessive military specifications and standards or contractor prepared documentation on a program. These only delay development lead-times and lead to higher than necessary costs.

The current acquisition system discourages risk taking to the detriment of the warfighter. Those that do consciously deviate from policy and directives place their careers in jeopardy. Program failure, regardless of cause, can mean career termination. As such, most program directors and support staff follow the rules, even when other courses of action may be more expedient and efficient. Mr. Krikorian does not advocate breaking the law. His point is the system is over regulated and therefore stifling program management. We must give program directors the flexibility to do the right thing within the limits of law. Those charged with oversight must be aware of the risks and risk management strategies. Occasional failure should not result in renewed emphasis on restrictive policies that penalize all programs for the mistakes of a few. Ultimately, it is the warfighter and the taxpayer who must pay the price.

The industry survey added valuable insight and provided support for our recommendations. Centralized control and decentralized execution are validated as standard business practices. Development of a strategic plan is also a standard business practice that integrates and prioritizes requirements, technology and budgeting across a planning period. Finally, the logic of the DoD product development cycle is sound. It is the implementation of the process—rigid sequential phases and excessively restrictive policies and oversight—that is faulty.

## **Chapter 7—Implementation of the Reengineered Acquisition System**

To take full advantage of an MTR, as discussed by Andrew Krepinevich,<sup>110</sup> the military must undergo process, organizational and cultural/behavioral changes. Each of these three aspects is equally important. A true MTR cannot be successful if any one of these aspects alone is changed. Our reengineering acquisition proposal is a revolution of sorts. We are challenging the acquisition community to expand their sights past the service parochialism that currently strangles the DoD acquisition system. We stress the need to think jointly to enable the DoD to find joint solutions that maximize its return on investment while minimizing suboptimization in meeting requirements. We also stress the need to marry requirements “pull” with technology “push” to provide the warfighter with the best tools possible to fight and win the wars or MOOTW of the future. Above all, we place high value on the free flow of open communication between the warfighter, as the main requirements generator, and the JAFIC, as the requirements acquirer, to enable the concept of centralized control with decentralized execution to function smoothly and effectively.

What is the best way to initiate this acquisition revolution? We all know that even the smallest change can wreak havoc within an organization. Like throwing a stone into a pond, the slightest change in the acquisition system sends endless ripples throughout an organization. Our proposed acquisition revolution is no small change. We are asking an ingrained bureaucracy to adopt an entirely new way of doing business. We are also recommending changes to laws. This sort of change does not happen overnight, nor does it

happen uncontested. We, therefore, propose a methodical phasing of the changes, and assessing the results of each change for effectiveness via appropriate measurements before moving to the next phase. Initially, we need to bring about the changes slowly. However, as the DoD grows more accustomed to the new order and verifies the processes are working properly, we can shorten the implementation timetable. While we do not presume to have all the answers for implementation, we do have a vision of what an implementation plan might look like.

To break in the system improvements piece by piece, the first phase of our three-part implementation plan is to prepare the Joint Staff organizationally to assume its increased roles. We will first, significantly increase the roles and responsibilities of the JROC. In his article, Admiral Owens advocates expanding JROC authority into the planning and programming areas.<sup>111</sup> We propose “dual-hatting” the JROC, giving that already established and functioning body authority into oversight of acquisition execution issues. We will then rename the organization the JRAC.

To ensure the JRAC can function effectively, the group must have a staff capable of addressing the full range of issues involved in integrating the requirements, technology and budgeting processes. We will first add responsibilities to the existing J-8 structure within the JCS to encompass joint requirements validation, technology development and budget preparation. The enhanced J-8 organization will function as the conduit for feeding all proposed requirements to the JRAC for adjudication. The J-8 organization will serve as the gate keeper to ensure the requirements provided to the JRAC are capability, and not system, specific. Additionally, the J-8 will expand to accommodate greater emphasis on advancing the state-of-the-art in technology for the warfighter, integrating

emerging technologies into doctrine and preparing the DoD research and development budget to yield more complete joint requirements coalescence. We will discuss the J-8's further role in the budget preparation process below.

Admiral Owens has already developed teams charged with coordinating issues across the OSD, JCS and service staffs based upon mission area within the Joint Staff structure. This mission focus provides the foundation for our JMAAC concept, an integral portion of the expanded J-8 organization. We will establish JMAACs for each identified mission area as shown previously in figure 2. The JMAAC's purpose is to realistically affect the envisioned future military roles through development of new technologies in a timely fashion. Additionally, the JMAACs will bear the responsibility for joint doctrinal review with a technology focus. They will serve as the interface with the DoD laboratory structure to integrate technology "push" with requirements "pull." The JMAACs will pursue technologies that address validated mission deficiencies for their mission areas. They will also engage in analysis of doctrine to identify new changes brought about by new technology. This will ensure we do not, due to a lack of vision or over-zealous dogmatic belief in old doctrine, repeat our previous failings of not recognizing new technologies as offering a revolution in military affairs. After all, new technology and weapon systems are only half the solution for a more capable fighting force. To exploit these new technologies to their fullest may require new doctrine.

Once the requirements generation process has truly become a joint effort, it will be time to shift capability acquisition from a predominantly service oriented process to a predominantly joint oriented process. The JRAC, charged with overseeing the acquisition execution processes, will ensure this happens. In this capacity, the JRAC serves as the

Joint Acquisition Executive, responsible for reviewing program progress and evaluating each program's readiness to press on to the next phase. By assuming these roles, the JRAC will eventually replace the current system of the Defense Acquisition Executive (DAE), SAEs and Program Executive Officers (PEOs) for all programs.

To enable the JRAC to make effective acquisition execution decisions, the first step in the process would be developing and staffing a new organization within the Joint Staff—the J-9 Directorate of Acquisition. The J-9 staff will assume the functions currently conducted by the service acquisition executive staffs for all joint programs. The J-9 staff would consist of acquisition functionals in such specialties as contracting, cost estimating, financial management, legislative liaison and program element monitors. Its responsibility is to fully understand each program under JRAC purview in order to support the JRAC in its DAB decision making role. Additionally, the J-9 staff will be responsible for understanding acquisition policies as developed by OSD and interpreting them for the field acquisition community. Because we want to ensure free flow of communication between the Joint Staff and OSD, the J-9 staff will be responsible for providing information to OSD as required to assure them of satisfactory program progress. The enhanced J-8 and the new J-9 staffs, in essence, perform many of the duties currently conducted by the DAE, SAE and PEO. Thus the new joint staff offices will enable the component services to eliminate huge bureaucracies with a resulting, and much sought after, savings in personnel and time.

Once fully staffed and operational, it will be time to shift the responsibility for the preparation of the acquisition portion of the budget from the services to the joint staff's new J-8 and J-9 offices. We are fully aware that this is one of the most controversial as-

pects of our proposal. It takes a major vestige of power away from the services. It is also quite illegal under current law. This portion of the plan could bring the most in-fighting within the DoD. Legislative changes will take time to make. Thus we feel it is best not to make this change until the legal issues are resolved and the joint staff offices are fully operational. We must then ensure this most delicate of transitions goes smoothly and effectively.

After the transition, the new J-8 and J-9 staff will assume responsibility for preparing the POM. This will enable the incorporation of the JRAC's decisions, regarding requirements priorities and individual weapon system programs, into the FYDP. Additionally, the J-8 staff will assume responsibility for submitting the Budget Estimate Submission (BES) for acquisition funds to OSD in support of the preparation of the President's Budget (PB). To properly construct the BES, the J-8 staff will have to collate inputs from the individual services, the JMAACs and the JAFCS into one coherent BES product for submission to OSD. Using such an approach ensures the joint staff as a whole becomes accountable for properly executing a budget that they themselves prepared. This removes any chance for the joint staff to claim that poor service programming resulted in their inability to properly execute funds. Such an approach will also remove the temptation for the services to provide the joint staff with an unexecutable budget intent on trying to force this plan to fail. This check and balance procedure should calm the fears of the nay-sayers.

Following the joint staff's initiation into the programming world, it will be time to inaugurate them into the world of funds execution. Their first challenge will be to defend to OSD, and later to Congress, the portion of the acquisition budget they prepared during

the President's Budget Decision (PBD) cycle. This will provide the first public display of the importance of having a single face to all customers in matters associated with the acquisition budget. Rather than asking either OSD or the Congress to arbitrate between stridently supported service needs, this arbitration will be done at a lower level. Thus OSD and Congress will see a single, coherent position on acquisition priorities. Such a coherent position will greatly enhance the DoD's ability to defend its budget requests. After Congress passes the appropriation bill, the J-9 staff will assume the role of executing the year's funds. Upon successful completion of the organizational changes and shift of budget responsibility, phase one will be complete and phase two of the implementation plan will begin.

Phase two of the implementation plan calls for establishing a prioritized list of programs for transition to the new JRAC review process. Initially, we envision selecting a few pilot programs for JRAC oversight to test the efficacy of our JRAC approach as well as the functioning of the J-8 and J-9 staffs. We will choose the pilot programs from both new program starts—capability requirements surfaced through the J-8 via the JMAACs, CINCs, services and approved by JRAC as valid and needing new acquisition programs—and on-going joint programs encompassing a variety of capability needs across all services. The intent of pilot programs is to demonstrate the stability of centralized control, the flexibility of decentralized execution, and the effectiveness of streamlining the programmatic oversight. It is critical to baseline the exact status of all on-going programs accepted into the pilot program process. This is necessary to preclude the services from pawning off a program that is already in a desperate situation—whether in the cost, schedule or technical performance arenas—to ensure the joint acquisition concept does

not intentionally fail. It is also critical that we develop effective measures of merit to track future program progress. This will allow us to win over “nay-sayers” once the pilot programs are proven to be measurably more successful than their service-run counterparts. Phase two will be complete when each of the pilot programs successfully passes through one milestone review with the JRAC acting as JAE and issuing the Acquisition Decision Memorandum.

Phase three—the final phase of the implementation plan—entails setting timelines for JRAC review and execution of all currently on-going service unique SAE, PEO and Designated Acquisition Commander (DAC) programs and all future programs. Because of the large number of programs, the span of control for the JRAC and the J-8 and J-9 staffs could become unnecessarily cumbersome. We therefore propose to group programs that currently fall under the purview of the DACs by mission areas and establish one JAFc for the set of programs within each mission area. Each program falling in the JAFc’s portfolio would be led by a Joint Acquisition Task Force Commander (JATFC). As programs transition to the new system, we would begin to eliminate lines of communication regarding program reporting requirements and chain of command to flow between program directors and the DACs/PEOs/SAEs. Instead, we would route all lines of communication between program directors, the J-9 and the JRAC.

Commensurate with the concept of centralized control and decentralized execution, the role OSD currently plays in acquisition should shift as the joint staff begins to assume more control of the day-to-day execution of the acquisition system. The shift in OSD roles will occur during phase three of the implementation plan. However, they cannot occur before legislative changes are made. OSD will assume the role of developing

over-arching policies and providing robust supervision and coordination for the processes within the Planning, Programming and Budgeting system. Title II of the National Security Act requires that the Secretary of Defense (1) establish general policies and programs, (2) exercise general direction, authority, and control, (3) take steps to eliminate duplication, and (4) supervise and coordinate the preparation of budget estimates. These are the same basic precepts echoed in Title 10, the most current legislation concerning defense organization. The systematic changes recommended by this paper will meet these overall fundamental objectives.

We do not intend to downplay the importance of the OSD role in oversight of the processes. However, we believe in minimizing the current OSD involvement in the day-to-day execution of program acquisition. Control is not devolved to the JCS; however, responsibility for execution is. The OSD role will transition to developing the acquisition policies that guide the JRAC in making its milestone decisions. This shift in focus will enable OSD to disable a large portion of its staff currently devoted to managing program execution issues. Additionally, we envision OSD becoming actively involved in developing effective measurements of merit to ensure that the policies they develop are being properly implemented by the Joint Staff. To ensure that OSD is able to certify to Congress and to the public that the military is indeed properly managing the resources given to us, OSD will regularly receive all DAB's acquisition decision memorandums generated by the JRAC at each milestone review.

The changes for the OSD outlined here are positive. They serve to re-institutionalize the OSD as a 'corporate' entity by relegating many of the implements-of-war details back to the warfighters. The re-engineered acquisition solution is not an inhibitor or

hibitor or usurper of the authority and OSD responsibilities. Instead, it should facilitate the OSD role of functioning as developers of guidance and policy and as process owners.

Phase three will be complete when OSD staffs, currently managing program execution issues, are dismantled and statistical process control measures are in place to monitor DoD compliance with OSD policies.

### **Contextual Elements That Could Affect Implementation Plan**

The key to effective management of joint programs via the JRAC process is transfer of decision making authority for weapon system acquisition execution issues from OSD to the Joint Staff. Through Title 10 of the USC, the services are responsible for training and equipping forces for combat. Moving the authority for preparation and obligation of the acquisition budget from the services to the joint staff will require a change to the law. Therefore, this issue will be particularly contentious among the services and raises the specter that service parochialism will continue. Commensurate with this shift must come programming, budgeting and funds execution authority from the services to the JRAC. This will require full OSD, JCS and service support and positive Congressional opinion during the implementation process. We are proposing to take vast amounts of power away from OSD and the services and giving this power to the joint staff. There will be great opposition to such a change. There can be a perception that, in an attempt to reach consensus, the JCS will reach compromise solutions of the lowest common denominator that really would not meet any service's requirements. Extrapolated, this can result in the fear that the JRAC will suboptimize a solution to a service-surfaced requirement. The "nay sayers" will view any mistake as proof positive that the changes will not work

and could result in a backlash of even more Congressional and OSD micro-management of the military. We must minimize any loss of control of the joint programs during the transition.

Regardless of the changes in the acquisition system, we must remember that we cannot change the ultimate interest and oversight on the part of Congress. The Constitution charges Congress with preparing the budget for the country. Because the acquisition funds accounts are a large chunk of the DoD budget, Congress will never relinquish its control over weapon system procurements, regardless of any changes in the DoD processes. However, the current trend of increased Congressional micro-management during program execution will decrease as the military improves its processes and provides substantive proof, via both statistical process control measures and satisfied warfighters, that our new processes are producing better results.

With all agencies of the federal government vying for fewer and fewer tax dollars, the DoD cannot afford to show three separate faces and service infighting to Congress. For each time we in the military show lack of a single coherent strategy to Congress we diminish our reputation. Through our phased implementation approach, which enables the military to assimilate the process changes before incorporating additional ones, we hope to calm the fears of the “nay sayers.” However, we realistically understand that we will not convert the true diehards until the warfighters from all services receive weapons that meet or exceed their requirements, on or ahead of schedule, at or below anticipated cost.

Concern over loss of civilian control of the military may drive OSD to at best oppose, and at worse prevent, changes to its oversight capacity which it perceives as minimizing its power and control. Additionally, buried deep within the OSD staff are numer-

ous “rice bowls” that, if not charged with monitoring day-to-day execution of program management, would cease to exist. The instinct for self-preservation is strong. In a bureaucracy as huge as the DoD, this instinct can prevent a group from realizing that which is good for their individual part is not good for the whole. Additionally, Congress often links OSD certification of satisfactory program progress to funding. Our recommended improvements will perhaps meet their strongest opposition in OSD.

In countering such opposition, we would cite the parallel case of OSD’s involvement in a CINC’s waging of a joint military campaign. This parallel shows the importance of centralized control and decentralized execution. The Secretary of Defense, in his role as a key member of the National Command Authority, provides over-arching strategic objectives to the CINCs and guidance regarding the rules of engagement for the conflict. However, the day-to-day execution of the war is left to the military. The public has been clamoring for a reduction in the size of the federal bureaucracy. Our concept, which enables to DoD to dramatically reduce the size of its infrastructure, is consistent with the wave of public opinion.

## **Chapter 8—Conclusion**

The future for the DoD as a whole, and the DoD acquisition community in particular, will be very challenging. Shrinking budgets, changing roles and the ever increasing pace of technological growth will place even greater demands on the DoD acquisition system to be more flexible, to better respond to the needs of our warfighters. The services must address these needs from a joint perspective if we are to effectively manage taxpayers' dollars. The DoD can ill afford to squander millions of dollars on parochial interests.

The DoD has a long history of implementing initiatives aimed at streamlining the acquisition system. However, these evolutionary changes have yielded, for the most part, only marginal increases in system performance. Given the current and future environment, we contend the only viable option to significantly improve the acquisition system is through revolutionary changes based on reengineering of the essential processes.

Early in this paper, we traced a series of attempts at improving DoD acquisition. We also justified the need to take a fundamental relook at the acquisition system's essential processes. We applied the principles of reengineering to the five macro processes that comprise the DoD acquisition system—requirements, technology, budgeting, management and O&S. We discussed the interaction and interdependence between the processes and then analyzed each individual process in-depth.

We then addressed, in detail, our proposal to improve the acquisition system by focusing on the tenets of centralized control and decentralized execution within a joint

framework. We suggested changes in all five macro processes and then devised an organizational structure to support them. Injecting an expanded JROC, as a JRAC, across the spectrum of acquisition processes, underpins our solution. We propose having the J-8 staff assume expanded responsibility for the requirements, technology and budgeting processes. We also propose establishing a new J-9 Directorate of Acquisition to oversee the management processes and the JAF's execution of individual capabilities' acquisitions. By vesting greater authority in the JCS, we believe the interservice politics that currently impact the acquisition business will be significantly reduced. This will result in more effective management of all programs and a significant reduction in the duplication of programs across the services. Additionally, as the processes mature, our civilian leadership will be free of the burden of arbitrating interservice disputes and will no longer be bound by the requirement to oversee day-to-day program execution issues. They will be able instead to focus on using their talents and knowledge of the political climate to provide over-arching, corporate-level guidance to the military departments.

Finally, we outlined our vision of how to implement our proposed improvements to the system. We discussed the potential political impediments that we must consider in implementing our proposed changes. By using a methodical, phased implementation plan, we hope to significantly reduce the organizational confusion caused by these revolutionary changes.

The DoD acquisition system has proven incapable of providing consistently acceptable output in the form of quality weapon systems to US warfighting commands. Dramatic improvements at the macro process level are essential. Just as the combatant commands have benefited from increased emphasis on joint warfighting techniques, so too

could the acquisition community benefit from a joint approach to acquisition. We must settle for nothing short of a reengineered approach to acquiring capabilities to fight whatever foe our warfighters may come up against. The acquisition system's key processes beg for integration along joint lines. The warfighters deserve it. Congress and taxpayers demand it.

### **Recommendations for Future Research**

Due to the size and complexity of the DoD acquisition system, we had to focus our efforts on reengineering the macro level processes. However, while conducting our research, we identified other potential topic areas for future research. The following is a list of potential follow-on topics and supporting rationale for their study:

1. Identify other potential organizational structures to support the joint concept. The organizational approach we identified is just one potential way of structuring this organization. There are numerous other possible approaches to establishing this organization. A follow-on study could address the advantages and disadvantages of these other organizational structures.
  - a. Research the feasibility of converting to a DoD acquisition agency. Our proposal takes the first steps toward greater jointness in the acquisition arena. As our forces and budgets continue to decline in the fast paced, high tech world of the future, a DoD acquisition agency may be an idea whose time has come. This topic would be a very controversial area for further research, however, it could provide valuable insight into coping with future environments.
2. Reengineer the specific implementation of the PDC to encourage concurrency. Strategies will have to be adopted to manage risk, and cultures adapted to recognize some waste or added up-front costs are favorable to extended developments. With the ever increasing pace of world events characterized by expanding and changing threats, we must consider all avenues to increase the responsiveness of the acquisition system.
3. Identify and reengineer other processes, below the macro level, that will enhance the effectiveness of the functional specialties within the overall DoD acquisition system. By addressing other subprocesses in subsequent research efforts—cost estimating, program management and reporting, system engi-

neering, test and evaluation, etc.—we may eventually reengineer the entire acquisition system and produce a system capable of providing all capabilities to the user within the FYDP timeframe.

4. Apply our proposed solution to other types of acquisition. We have only looked at the viability of employing this concept in the weapon system acquisition arena. Further research on the suitability of applying this proposed solution to other types of acquisition such as military construction, operational contracting or sustainment, may prove beneficial.
5. Employ our proposed solution from “cradle to grave” of our weapon systems. Our research focused on the early phases of a weapon system acquisition. Subsequent research could address the feasibility of using this approach throughout the entire acquisition cycle. Further research could focus on the advantages and disadvantages of applying our proposal in this joint environment.

## Notes

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<sup>4</sup> Maurice A. Roesch, III, A Methodology for Defense Systems Acquisition, University of Virginia, VA 1979, 3.

<sup>5</sup> Ibid., 4.

<sup>6</sup> Rockefeller Commission, Report on the President's Commission on Organization of the Executive Branch of the Government, (Washington DC: Government Printing Office, 1955), A-2.

<sup>7</sup> Ibid., A-79.

<sup>8</sup> W. D. Putnam, Evolution of the Air Force System Acquisition Management, Rand Corporation, Santa Monica, CA 1972, 10.

<sup>9</sup> Donald L. Pilling, Competition in Defense Procurement, The Brookings Institute, Washington, DC 1989, vii.

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<sup>14</sup> George Krikorian, "Streamlining the Defense Acquisition system," National Defense: (April 1993), 20.

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<sup>62</sup> Elton C. O'Byrne, "Advanced Distributed Simulation," Marine Corps Gazette, (July 1994), 19.

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<sup>65</sup> David I. Cleland, James M. Gallagher, Ronald S. Whitehead, Military Project Management Handbook, (New York, NY: McGraw-Hill, Inc., 1993) I.9.

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<sup>70</sup> David F. Todd and Ralph M. Hitchin, "Cutting Defense, Method Instead of Madness", Joint Force Quarterly, (Summer 1994), 92.

<sup>71</sup> DoDI 5000.2 part 4, section B paragraph 2.

<sup>72</sup> A major defense acquisition program is one designated by the OUSD(A&T) or a program with program expenditures for RDT&E in excess of \$200M in FY80 constant dollars or a program with expenditures for procurement of more than \$1B in FY80 constant dollars--other program descriptions in DoDD 5000.1, paragraph C.

<sup>73</sup> JROC membership consists of the VCJCS (chair) and Vice Chief of Staffs from each of the services. JROC responsibilities are outlined in DoD Directive 5000.1 and DoDI 5000.2 as well as CJCS MOP 77.

<sup>74</sup> Charles Link, Maj Gen (USAF), "Roles and Missions" briefing presented to the faculty and staff of Air Command and Staff College, 21 October 1994.

<sup>75</sup> Jo Anne Rumble, "The Master Plan," Leading Edge, (January 1995), 11-13

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<sup>77</sup> Kevin A. Sheehan, Lt Col, USAF, HQ AFMC/STPW, Wright-Patterson AFB, OH, comments to draft paper, 13 April 95.

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- <sup>85</sup> AQ Program Element Monitor/Action Officer Handbook, II.D.5.
- <sup>86</sup> Ibid., II.D.5.
- <sup>87</sup> The Planning, Programming and Budgeting System Primer, 19.
- <sup>88</sup> Ibid., 24.
- <sup>89</sup> Ibid., 25
- <sup>90</sup> Ibid., 24.
- <sup>91</sup> AQ Program Element Monitor/Action Officer Handbook, II.D.5.
- <sup>92</sup> Ibid., II.D.9
- <sup>93</sup> Ibid., II.D.6.
- <sup>94</sup> The Planning, Programming and Budgeting System Primer, 10.
- <sup>95</sup> Ibid., 30.
- <sup>96</sup> AQ Program Element Monitor/Action Officer Handbook, II.D.3.
- <sup>97</sup> The Planning, Programming and Budgeting System Primer, 26.
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- <sup>99</sup> "Force XXI," Army Focus 94, 9-16
- <sup>100</sup> Rockefeller Commission, Report on the President's Commission on Organization of the Executive Branch, Washington GPO, 1955, A-79.
- <sup>101</sup> William A. Owens, Admiral, "JROC: Harnessing the Revolution in Military Affairs," Joint Force Quarterly: Summer 1994, 56
- <sup>102</sup> Tamar A. Mehuron, "The new Budget at a Glance," Air Force Magazine, April 1995. 78:9.
- <sup>103</sup> Krikorian, George. Telephone interview. 5 April 95

<sup>104</sup> McDonough, Condon. Telephone interview. 5 April 95.

<sup>105</sup> Krikorian, George. Telephone interview. 5 April 95..

<sup>106</sup> Kelble, Jack and Rex Punchard. Telephone interview. 5, 7 April 1995.

<sup>107</sup> Kelble, Jack. Telephone interview. 7 April 1995.

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## **Annex A**

We submitted the following letter with attachments to several defense industries. The premise of the survey was to validate our contention that centralized control and decentralized execution of the acquisition system was the better way to conduct business within the DoD. The industries we received responses from include:

1. Raytheon Corporation, Electronic Systems Division, Mr. Jack Kelbie and Mr. Rex Punchard, Marlboro MA.
2. Textron Defense Corporation, Mr. Condon McDonough, Marketing Manager, Wilmington MA.
3. Riverside Research Institute, Mr. Mel Weiner, Director of Operations, Bedford MA.
4. TRW Incorporated, Space and Electronics Group, Mr. Richard Silva, Arlington VA.
5. Mr. George Krikorian, Forrestal-Richardson Memorial Chair, Professor of Program Management, Defense Systems Management College, Ft Belvoir VA.
6. Texas Instruments Inc., Defense Systems and Electronics Group, Mr. John Grimm, Director, Systems Engineering, TI Fellow, McKinney, TX

## **SAMPLE LETTER**

Air Command and Staff College  
225 Chennault Circle  
Maxwell AFB AL 36117-6426

(Date)

(Corporation Name  
Mailing Address)

Dear (Name),

We are a group of USAF Air Command and Staff College students embarked upon research geared at reengineering the DoD weapon system acquisition system. Our evaluation and recommendations for change are based on a process approach and are focused on the macro set of DoD policies. We feel deep parallels can be drawn between the way DoD and industry effect process improvement and do product development. To further refine our thesis, we would like to draw upon your established experience along several lines.

Attached is a set of questions and themes dealing with new business operations and product development. We are interested in learning about your organization's policies or practices with regard to each theme or approach. In return, we are ready to share with you our eventual recommendations for changes to the DoD acquisition system through either direct discussion or by providing you a copy of the final report once available in June. We would greatly appreciate hearing from you by 19 April as our final report is due 1 May 95. Your written response should not be elaborate. In fact, we are available for audio or video teleconferencing to more informally discuss these issues.

We firmly believe that this kind of dialogue and sharing of business practices between DoD and industry is mutually beneficial. A better understanding of the way we both operate can only result in better customer-supplier relationships in the future. We look forward to learning from you and sharing with you our findings.

Sincerely,

JEFFREY W. WANDREY, Major, USAF  
Seminar 8/Phone 334-953-6700

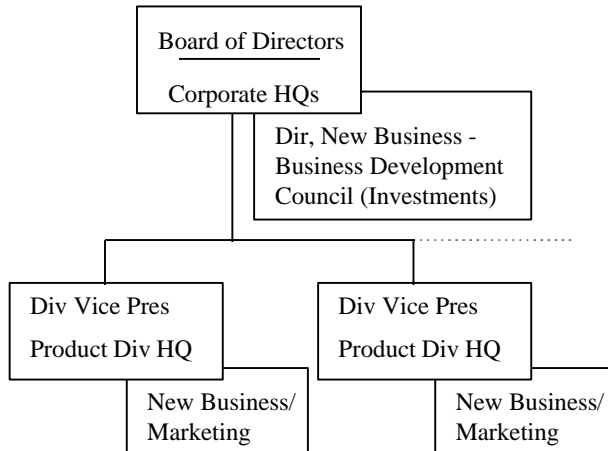
DOUGLAS K. COOKE, Major, USAF  
Seminar 3/Phone 334-953-6756

RANDY J. KOSINSKI, Major, USAF  
Seminar 40/Phone 334-953-2060

# New Business Investment and Product Development

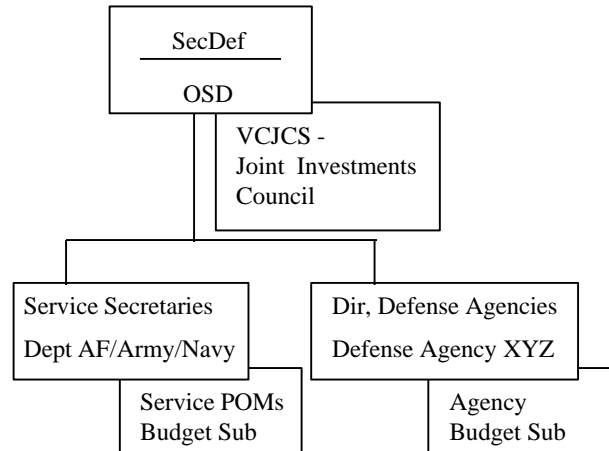
- How are corporate investment decisions made? Who makes them and at what level?
- Is centralized control exercised over new business requirements/technology/financing? If so, at what level (BoD, Corp HQ, other)?
- Is decentralized execution exercised once new business initiatives are approved? If so, at what level?

## Generic Corp Structure?



- New business recommendations bubble up from below based on general Corp and Div level guidance.
- A council at Corporate level collates initiatives from Div's , analyzes based on long term profitability, return on investment, financing, etc and makes prioritized recommendations to Dir, New Business
- New business initiatives optimized based on corp profitability
- New Business recommendations are sanctioned by BoD

## Proposed DoD Parallel?

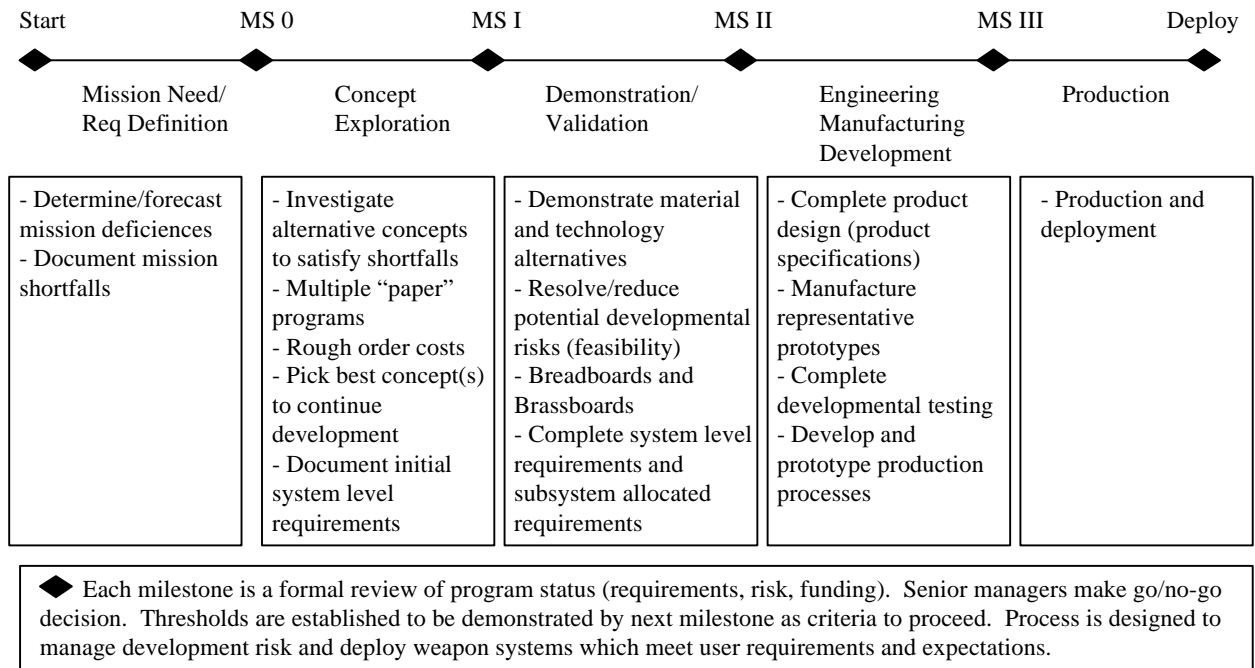


- Services/Agencies submit prioritized budgets based on OSD guidance
- JCS (J-7,8,9) collates initiatives, analyzes in terms of joint capability, technology, and resources. Makes recommendations to VCJCS
- New initiatives optimized based on joint warfighting potential
- New initiatives are sanctioned by OSD

# Product Development Cycle

- How would you characterize your PDC?
  - Sequential phased approach vs. concurrent overlapping
  - Strict adherence to the PDC vs. situational driven by contextual elements such as risk)
- To what degree is your PDC driven by technology “push” vs. customer requirements “pull?”

## Current DoD Product Development Cycle Phased, Sequential Process



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## Acronyms

|         |  |
|---------|--|
| ACC     | Air Combat Command                         |
| AFMC    | Air Force Materiel Command                 |
| AFSC    | Armed Forces Staff College                 |
| AMRAAM  | Advanced Medium Range Air-to Air Missile   |
| ASPJ    | Airborne Self Protection Jammer            |
| ATACMS  | Attack Missile System                      |
| AWACS   | Airborne Warning and Control System        |
| BES     | Budget Estimate Submission                 |
| BoD     | Board of Directors                         |
| CINC    | Commander-in-Chief                         |
| CONPLAN | Concept Plan                               |
| CONUS   | Continental United States                  |
| DAB     | Defense Acquisition Board                  |
| DAC     | Defense Acquisition Commander              |
| DAE     | Defense Acquisition Executive              |
| DoD     | Department of Defense                      |
| DoDD    | Department of Defense Directive            |
| DoDI    | Department of Defense Instruction          |
| DPG     | Defense Planning Guidance                  |
| DSARC   | Defense Systems Acquisition Review Council |
| DSMC    | Defense System's Management College        |
| FYDP    | Future Year Defense Plan                   |
| IOT&E   | Initial Test and Evaluation                |
| IPL     | Integrated Priority List                   |
| IPT     | Integrated Product Team                    |
| IR&D    | Independent Research and Development       |
| JAE     | Joint Acquisition Executive                |
| J AFC   | Joint Acquisition Force Commander          |
| JATFC   | Joint Acquisition Task Force Commander     |
| JCS     | Joint Chiefs of Staff                      |
| JFACC   | Joint Forces Air Component Commander       |
| JFC     | Joint Forces Commander                     |
| JMAAC   | Joint Mission Area Acquisition Commander   |
| JRAC    | Joint Requirements and Acquisition Council |
| JROC    | Joint Requirements Oversight Council       |
| JSIP    | Joint Strategic Investment Plan            |
| JTF     | Joint Task Force                           |
| MAA     | Mission Area Analysis                      |

|        |  |
|--------|--|
| MDA    | Milestone Decision Authority   |
| MNS    | Mission Need Statement   |
| MOE    | Measure of Effectiveness   |
| MOOTW  | Military Operations Other Than War                                     |
| MPP    | Modernization Planning Process   |
| MRC    | Major Regional Conflict  |
| MTR    | Military Technological Revolution                                      |
| NATO   | North Atlantic Treaty Organization                                     |
| NME    | National Military Establishment—precursor to the Department of Defense |
| NMS    | National Military Strategy   |
| O&S    | Operations and Support   |
| OMB    | Office of Management and Budget  |
| OPCON  | Operational Control  |
| OPLAN  | Operation Plan   |
| ORD    | Operational Requirements Document                                      |
| OSD    | Office of the Secretary of Defense                                     |
| PB     | President’s Budget   |
| PBD    | President’s Budget Decision  |
| PDC    | Product Development Cycle  |
| PEO    | Program Executive Officer  |
| PGM    | Precision Guided Munitions   |
| POM    | Program Objective Memorandum   |
| PPBS   | Planning, Programming and Budgeting System                             |
| R&D    | Research and Development   |
| RDT&E  | Research, Development, Test and Evaluation                             |
| RFP    | Request For Proposal   |
| RMA    | Revolution in Military Affairs   |
| SAE    | Service Acquisition Executive  |
| SECDEF | Secretary of Defense   |
| SPO    | System Program Office  |
| TLAM   | Tomahawk Land Attack Missile   |
| TMP    | Technology Master Plan   |
| TOA    | Total Obligation Authority   |
| TSSAM  | Tri-Service Standoff Attack Missile                                    |
| UCP    | Unified Command Plan   |
| USC    | United States Code—federal laws  |
| VCJCS  | Vice Chairman Joint Chiefs of Staff                                    |

## **Vita**

**Timothy Ceteras:** Major Ceteras received his commission in the United States Air Force through the Reserve Officer Training Corps in 1981. Since entering the Air Force he has served in a variety of contracting positions to include intelligence and command, control, communications and countermeasures (C3CM) programs. He received a Masters degree from the Air Force Institute of Technology in contract management. He is a recent graduate of Air Command and Staff College and is currently a member of the faculty. Permanent address is 7705 Peachmont Dr NW, North Canton, OH, 44720.

**Douglas Cooke:** Major Cooke received his commission in the United States Air Force through the Reserve Officer Training Corps in 1980. While in the Air Force he has served in a variety of acquisition positions including logistics, systems engineering, funds management and program management for radar, intelligence and electronic warfare systems. His most recent assignment was as a Program Element Monitor at HQ USAF/INR for unique intelligence systems. He received his Masters degree in Engineering from the Air Force Institute of Technology and is a recent graduate of the Defense Systems Management College Program Manager's Course. Following Air Command and Staff College he will be assigned to the Systems Acquisition Directorate, Acquisition/Theater Missile Defense Deputate, Ballistic Missile Defense Organization, Washington DC. Permanent Address is 2028 Admiral Drive Stafford, VA 22554.

**David Glowacki:** Major Glowacki received his commission in the United States Air Force through the U. S. Air Force Academy in 1980. He has served in numerous assignments of logistics, systems and specialized contracting as well as serving on the Headquarters, Air Force Materiel Command contracting staff. His Masters degree in contracting management is from the Air Force Institute of Technology. Upon graduation from Air Command and Staff College he will be assigned as the commander of the Defense Plant Representative Office at Allied-Signal in Teterboro, New Jersey. His permanent address is 3900 E. Pulaski Ave., Cudahy, WI 53110.

**Janet Hockersmith:** Major Hockersmith received her commission in the United States Air Force through the Reserve Officer Training Corps in 1980. She has served in numerous acquisition positions. These include the Foreign Military Sale of the F-16 to Israel, Air Defense Fighter, CSOC, JSTARS and as Administrative Contracting Officer for five missile production programs at Hughes Missile Systems Group. She received her Masters degree from the Air Force Institute of Technology in 1984 with a specialty in contracting and manufacturing management. She also served as an instructor at Squadron Officer School before joining the staff of Air Command and Staff College. After graduation, she will be assigned to the Defense Plant Representative Office for Texas Instruments in Dallas, Texas with primary duties as a program integrator for the HARM program.

**Pamela Hodge:** Major Hodge received her commission in the United States Air Force through Officer Training School in 1981. She has a Bachelor of Science degree in Mechanical Engineering from Prairie View A&M University and a Master of Science Degree in Electrical Engineering from the Air Force Institute of Technology. Major Hodge co-

authored a technical paper with Professor M. E. Franke of AFIT which has been accepted for presentation at the 4th ASME/JSME Thermal Engineering Joint Conference in March of 1995. She served one tour on the Air Staff, one tour in major program acquisition program management, and one tour in depot logistics engineering. After graduating from Air Command and Staff College she hopes to return to an acquisition assignment on the Air Staff or within the Office of the Secretary of Defense. Her permanent address is 3422 Chateau Dr., San Antonio, TX, 78219.

**Randy Kosinski:** Major Kosinski received his commission in the United States Air Force through the Reserve Officer Training Corps in 1982. Since joining the Air Force he has served in a variety of acquisition and logistics positions in support of multiple weapon systems including the F-5 and F-15 programs. His areas of expertise include program management, systems engineering and strategic planning. His most recent assignment included revising acquisition and logistics policy for the US Air Force and for Air Force Materiel Command. After graduating from Air Command and Staff College he will be assigned as a Program Element Monitor in the Pentagon office of the Secretary of the Air Force for Acquisition. His permanent address is 5105 W Roger St, South Bend, IN 46619.

**Laura Martin:** Major Martin received her commission in the United States Air Force through the Reserve Officer Training Corps in 1982. Throughout her career in the military she has served in a variety of program management assignments to include working in a contract administration office and on the F-16. She also served on the headquarters staff of a major product center and was involved in revising acquisition policy. Her last

assignment was at the Air Force Secretariat in the financial management arena. While there, she developed policies regarding Cost and Operational Effectiveness Analysis and weapon systems cost estimates. After Air Command and Staff College she will be assigned to the F-22 System Program Office at Wright Patterson AFB OH. Her address at the program office will be ASC/YFF, 2130 Fifth St, WPAFB OH 45433-7003.

**Loretta Starkey:** Major Starkey received her commission in the United States Army through the Reserve Officer Training Corps in 1979 with assignment to the Ordnance Corps. Until 1991 she served in a variety of missile materiel management assignments. She obtained a Master of Science degree in Systems Management, attended Training with Industry and completed the Army Command and Staff College by correspondence course. After transferring to the Acquisition Corps, she served in the Army missile project offices in a variety of positions to include two joint efforts. Following Air Command and Staff College she will be assigned to the Combined Arms Support Command at Ft Lee, VA.

**Jeffrey Wandrey:** Major Wandrey received his commission in the United States Air Force through the Reserve Officer Training Corps in 1982. After entering the Air Force he served in an intelligence assignment to provide threat assessment based on foreign advanced technologies. He then was assigned to several acquisition positions including the National Aero-Space Plane Joint Project Office and Air Combat Training Systems System Program Office. He also served on the headquarters staff of a major product center and was involved in revising acquisition policy. He attained a Master of Science degree in Aeronautical Engineering in 1991. After graduating from Air Command and Staff College he will be assigned as Deputy for Science and Technology Resources with the Directorate

of Science and Technology of the Assistant Secretary of the Air Force (Acquisition).

Permanent address is 228 Niagara Shore Dr, Tonawanda, NY 14150.